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ROTATED ISLAND GRAFT OPERATION FOR PTERYGIUM.

EDMUND D. SPAETH, M.D., F.A.C.S.

CANAL ZONE, PANAMA.

This operation isolates the bulk of the pterygium by four incisions. Sutures are introduced in such a way as when tightened to rotate the isolated square 90 degrees. It is fixed in position with the help of additional sutures if needed. The operation is applicable only to exceptionally severe cases, which may have not been corrected by other operations. Published by permission of the Surgeon-General who, however, is not responsible for the contents of the article.

The operations of pterygium, as now established, are almost standardized. The McReynolds, The Knapp, the Desmarres', and the Ziegler operations should take care of all of the average cases. Up to very recently, that is, within eight months, I had assumed that this was true. In fact, there was no reason to think otherwise, for *ipse facto,* I had no need for any other procedures.

Occasionally, severe, recurrent and unusual pterygium cases present themselves. Among others, one such was referred to me wherein there was great conjunctival loss.

The first operation had been a simple pterygium resection; the second, a McReynold's; and the third,—following a second recurrence,—must have been some modification of the Desmarres operation. This last procedure cured the case permanently but because of the great operative wastage of conjunctiva in the case, the patient had, for all practical purposes, a posterior symblepharon. The eyeball was definitely limited in abduction as well as adduction, tho less so. The lower conjunctival cul-de-sac was lost with some inner angle entropion, and the patient had a diplopia when looking, even very slightly, to the left. There was a thick white adherent scar at the site of the pterygium head on the corneoscleral limbus with some puckering of the conjunctiva in fine converging lines, or folds, brought together to a broad apex about three mm. from the limbus.

The conjunctival adhesions were incised and undermined until the eye could move normally in all directions without diplopia. The incision made was T-shaped, lying upon its side, with the shorter cross bar at the limbus and with the longer branch extending well into the canthal angle. The lower cul-de-sac was reformed by the downward displacement of the conjunctiva and held there, until healing had occurred, by several sutures passed from the depths of the new cul-de-sac thru the thickness of the lids to the skin surface. There, they were tied over thin perforated plates. The triangular defect remaining was filled in with a thin, buccal mucous membrane, free graft and the patient made an uneventful and functionally satisfactory recovery.

Since July, 1925, I have been on duty in the Canal Zone. While it is common knowledge to all ophthalmologists that pterygium is quite frequent in the natives of certain tropical countries, (see Tropical Ophthalmology—Elliot), I was astonished at the extent of the growth in some of the pterygium cases which came under my care. Native Panamanians, imported colored Jamaicans, as well as their locally born children, Porto Ricans, and one time residents of Martinique, Colombia and Costa Rica were included. Almost all of them, past eighteen years of age, had small quiescent pterygia, with less than one mm. encroachment upon the cornea. These cases, when operated, needed no unusual methods for their correction, nor were there any recurrences in these cases. Others were not so simple, especially those in the older patients, past middle age.

Figures 5, and 6; also 8, and 9, were such cases. They were quite similar to that type of defect first described

herein. The first, Fig. 5, was on a Porto Rican noncommissioned officer. The second, Fig. 8, was a patient from Martinique.

The pterygia were thick, fleshy masses of tissue drawn toward the cornea in an upward convexity, loop manner, well over on to the cornea into the area of the pupillary aperture; the inner angle conjunctiva taut and the caruncle dragged out from its recess for a distance of several millimeters. A probe could be passed from above behind the pterygium into a blind pouch, the same from below, both times only hindered from complete passage and reappearance upon the opposite side by a thin, double thickness of normal conjunctiva passing over from the sharply demarcated edges of the pterygium and folded inwardly beneath it. The growing head of the pterygium, in both instances, was broad and with very many fine blood vessels. The heads had an appearance one can duplicate by squeezing a soft piece of a wax taper against the side of a glass, a bulbous tip, and sharply outlined elevated margins.

I was most unwilling to operate on them according to methods in common practice. The involvement was so extensive that frankly I doubted whether success would follow.

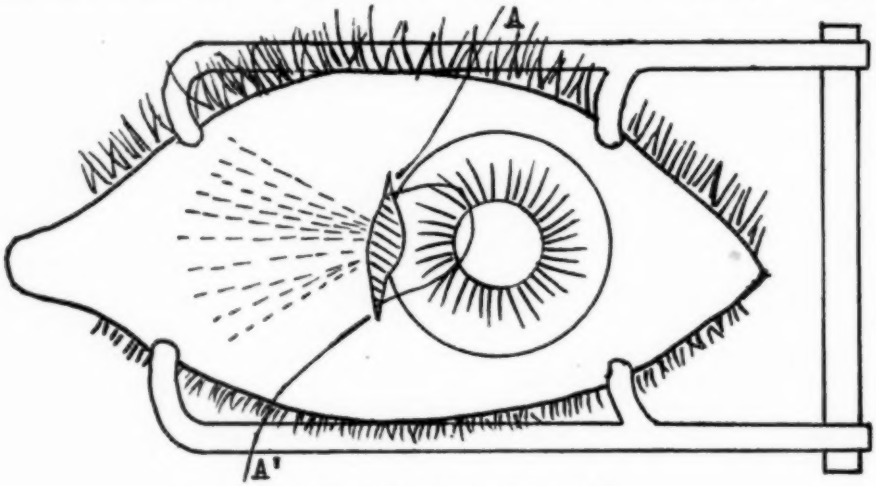

Fig. 1. Suture 'A' and the first incision.

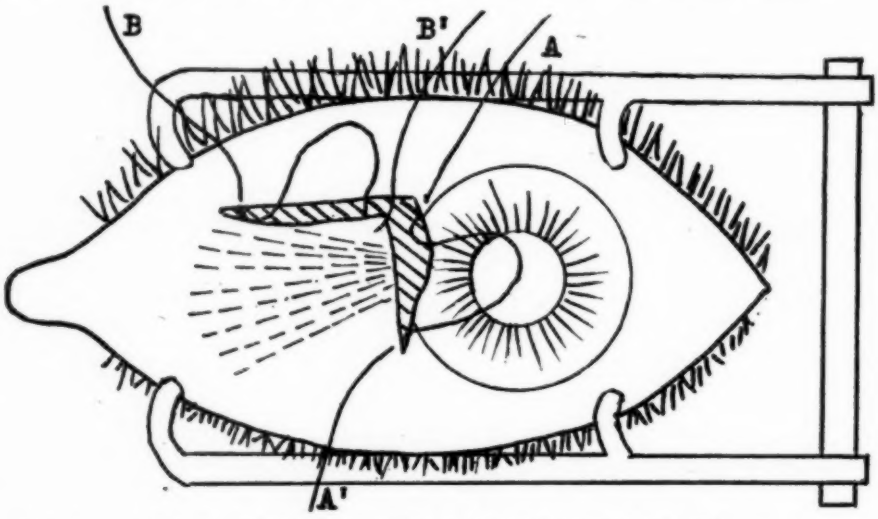

Fig. 2. Suture 'B', in addition to A, and the second incision.

About four years ago a South American ophthalmologist reported his surgical technic for the correction of pterygium. He resected the growth in its entirety as a rectangular free graft, lifted it upon a spatula, turned it 180 degrees, and then sutured it into the defect again. Now, the head pointed towards the inner canthal angle and the base lay juxtacorneal. I had never done this operation but it inspired me to carry out the procedure

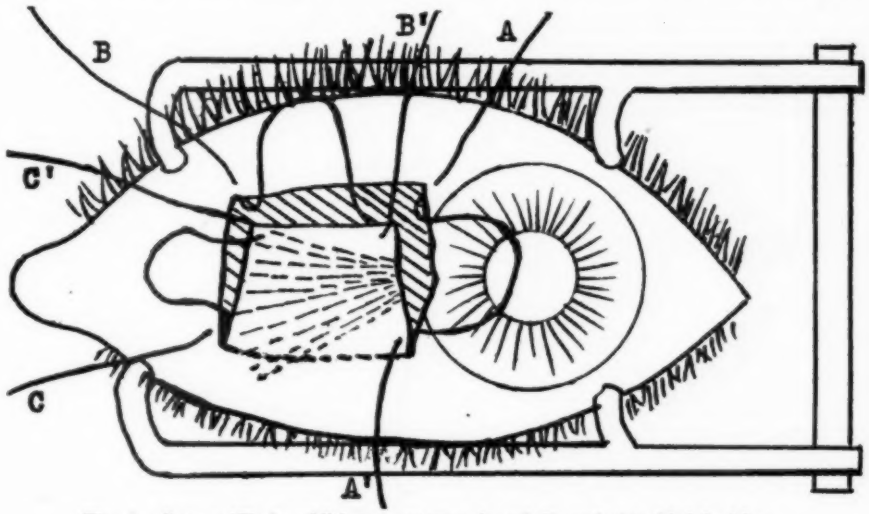

Fig. 3. Suture 'C', in addition to sutures A and B, and the third incision.

used and described below. After much consideration, including the possibility of complete radical resection with a subsequent buccal, mucous membrane, free graft, the following technic was developed. This technic, as given here and as now done, is slightly modified from that first done.

OPERATION.

INSTRUMENTS. The instruments required are: a Murdock lid speculum, straight iris forceps, sharp probe with eye, straight iris scissors, blunt iris scissors, (for cutting sutures), spoon curette, needle holder, four to six number 1 or 2 braided fine black silk sutures threaded upon medium sized full curved, eye, cutting edge needles.

ANESTHETIC. 4% cocain; this was used in six instillations at three minute intervals with two additional instillations of 1-1,000 adrenalin chlorid solution. (The upper lid lashes are almost invariably trimmed as part of the routine preoperative toilet of the eye.)

TECHNIC. A sharp probe was passed under the head of the pterygium and a stout silk suture threaded thru this perforation. The head was torn from the cornea with this suture and with iris forceps. A careful curettage was then done of the area of the corneal attachment, using a sharp spoon curette.

A perpendicular tangential incision was continued in this line of divulsion, above and below, a total length equal to the width of the base of the pterygium. Braided black silk suture (A) was then passed thru the fixed bulbar conjunctiva at the upper extremity of the incision, in its outer lip, and near the cornea, including a bit of the episcleral tissue; the loop carried across the pterygium and passed into the bulbar conjunctiva thru the inner lip of the lower extremity of this incision. The loop was then drawn away from the operative field. Fig. 1.

A second incision was made from the upper end of the first, horizontal and at a right angle to it, into the canthal angle. If the length of the first incision has been properly made this horizontal incision will include the upper edge of the pterygium back to its base. Suture (B) is then to be passed from the inner extremity, upper lip, of this incision, across the length of the pterygium into the upper, outer angle of bulbar conjunctiva outlined by and within these two incision. The loop

of this suture is also withdrawn from the operative field. Fig. 2.

A third incision, this time perpendicular, is to be made from above downwards across the base of the pterygium, paralleling the first and of similar length, starting at the inner extremity of the horizontal incision just explained. The incision must lie external to the caruncle and should include sufficient subconjunctival areolar tissue to allow for the later rotation of the pterygium. Experience will tell this, tho the less incised, the more satisfactory and rapid the recovery. The tissue may be incised to the bare sclera including all subconjunctival tissue, without danger; but this is unnecessary. Suture C is then to be passed from the angle at the inner lip of the lower extremity of this last incision across the width of the base of the pterygium into the upper, inner angle of bulbar conjunctiva outlined by this last incision and the one immediately preceding. When this last cut is made some bleeding will occur. This can be stopped by slight pressure with a dampened gauze sponge. Fig. 3.

Single loose ties are then to be made in each of the three sutures, largely to move the loops from the possibility of being unintentionally cut, as well as to keep sutures A and C within the confines of the graft.

The cut shown by the dotted line in the third drawing of the technic is now made. This should be of the same length and parallel to the upper horizontal incision. Also, it must lie outside the flap or graft insertions of sutures A and C. As this cut is completed a square "island graft," (Esser), is outlined attached to the eyeball only by the uncut subconjunctival areolar tissue beneath it and by some loose subconjunctival areolar tissue at the inner canthus. Sutures A, B, and C are then tied and their ends cut short. As these are tied the pterygium, now in the shape of a graft, is rotated an angle of 90 degrees.

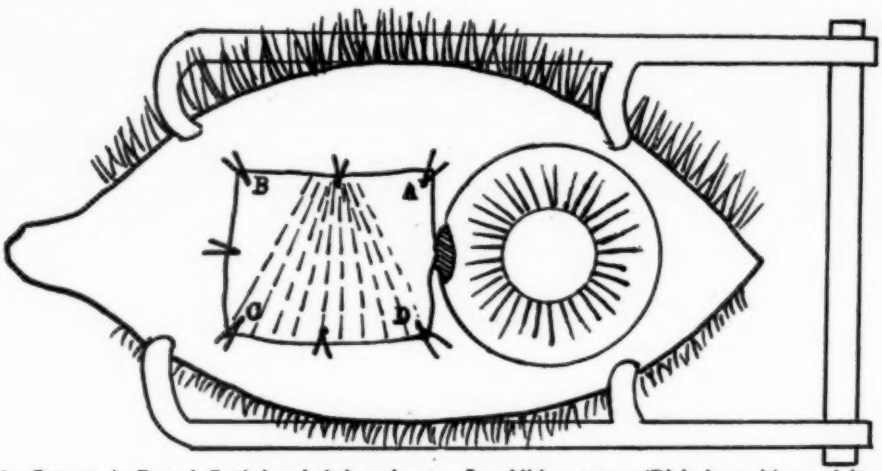

Fig. 4. Sutures A, B, and C, tied and their end cut. In addition, suture 'D' is in position and its ends cut. The necessary auxillary sutures are in place as well.

The head now points to the upper cul-de-sac and the base lies in the edge of the lower cul-de-sac. The graft will lie within the defect, if the incisions have all been made of the proper length, without tensions upon the sutures, the graft, or upon the surrounding bulbar conjunctiva.

Suture D is to be then inserted. This is placed thru the bulbar conjunctiva at the lower end of the first perpendicular incision and then into the corner of the rotated graft now lying in the angle formed by the first and the last incisions. The suture should include some episcleral tissue, the same as the first, and should hold the outer—juxtacorneal—edge of the rotated graft, rather taut tangentially to the cornea. It must not allow the edge of the graft to extend over upon the cornea. As a matter of fact, it is better to have a fine linear uncovered defect present, between the edge of this graft and the corneal epithelium defect caused by

the divulsion of the head of the pterygium from the cornea and the subsequent curettage.

Additional sutures are then placed in the center of the upper and the lower horizontal incisions, and another, if necessary, into the center of the innermost perpendicular canthal incision. tial. The last thing done before the bichlorid ointment, 1-5,000, is placed into the cul-de-sacs, is to stroke the edge of the graft gently away from the cornea, even removing, if necessary, a tiny slip of the graft with one snip of the scissors to be certain that it will not project over upon the cornea. A

Extensive pterygium before operation.
Fig. 5. Right eye. Fig. 6. Left eye.
Fig. 7. Same eye as Fig. 6, six weeks after the operation.

The first two will be necessary in most cases, the last, however, is not always necessary. It is well to place it the most superficial of them all, especially if the major part of the subconjunctival tissue at this place has been allowed to remain uncut. Fig. 4.

If there is any difficulty in freely rotating the graft, it may be necessary to introduce a blunt scissors beneath the graft and to cut more of the subconjunctival tissues until this is possible. No more should be cut than is essen- binocular dressing is to be used, with some slight pressure upon the eye with the gauze sponges. The binocular dressing is necessary, regardless of whether the operation is monocular or binocular. It has a tendency to keep the eye quiet and motionless in both instances. The patient is put to bed and the dressing is not disturbed for 72 hours. After that the bandage is removed, the lid margins are gently separated and cleansed with a quiet stream of warm boric acid solution. Additional bi-

Extensive pterygium before operation.
Fig. 8. Right eye. Fig. 9. Left eye. The outline of the palpebral fissures, as well as of the pterygia have been indicated on the photograph in ink.
Fig. 10. Left eye, case of Fig. 8 and 9, six weeks after operation. Notice light reflex over conjunctival area of pterygium; corneal scar and opacity. This appears as if it was the continuation of the conjunctival light reflex. (As a matter of fact, it is probably light reflex as well as scar, the scar being actually a bit bigger than one would think from this illustration.)

chlorid ointment is placed upon the lid margins and a second dressing applied for another 72 hours. At the end of that time the sutures may be removed and the patient allowed to go without a dressing; tho tinted glasses will be restful, because some slight photophobia is occasionally present.

COMMENT.

This operation has now been done in about 60 cases. Many of these were as severe as the two patients illustrated. Figure 7 is the same as figure 6, six weeks after the operation. The first 6 or 8 cases were checked, after the operation, by daily dressings. In some of them, after 24 hours the graft was a faint pinkish purple color as if there was some blood-tinged serum beneath the graft. This disappeared in each instance after the third day. The corneal defect was stained daily with alkaline fluorescein solution to observe the rapidity of the epithelialization of the defect. This occurred completely in each instance within four days. In two or three instances, in the earlier cases, the graft had extended slightly over upon the cornea after complete healing; but without dragging upon the remainder of the bulbar conjunctiva, and without blood vessels to indicate further advance. This little projection on the cornea remained unchanged in each instance, medial to an opaque, pure white spot.

Six weeks after healing, the area of the graft is outlined by a faint white rectangular scar, more or less adherent to the episcleral tissues but without any pull upon the remaining bulbar or palpebral conjunctiva. There were no recurrences in any of these cases. Eight months has now elapsed with many of them. Those early cases, wherein some conjunctiva from the graft had grown to the corneal defect, have had no further work done upon them. It is apparently unnecessary. This has not occurred in any of the later cases, simply because the juxtacorneal incision line and the edge of the graft was held with slight tension by sutures (A) and (D) to prevent the conjunctiva from creeping over upon the corneal defect. Naturally, there was an opacity of the cornea, at that area where the head of the pterygium had been attached. Those instances where the cornea over the pupillary aperture was involved, still had visual impairment remaining; but the patient could be assured that this would not become any worse.

This operation was done on some of the milder cases as well as upon the more severe ones. The results in these were eminently satisfactory as well, because it is a simple procedure and can be done fairly rapidly. While it is an operation designed primarily for the more severe and extensive cases, still,

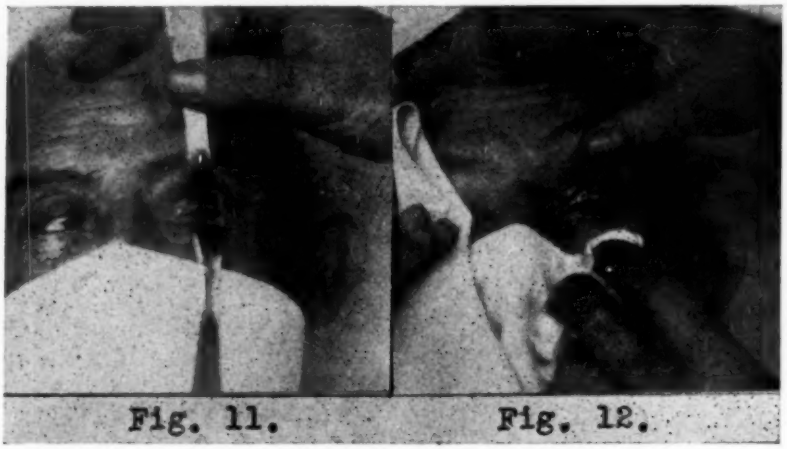

Fig. 11. Fig. 12.

Extensive pterygium.
Fig. 11. Before operation. A hand lens will assist in showing extent of growth.
Fig. 12. Same case as Fig. 11. Light reflex on the cornea obscures result. A hand lens, will show satisfactory correction.

it is applicable to all types. Recurrent pterygia, which unfortunately are not the most rare of eye conditions, should be readily corrected by this method.

It would seem that considerable effort is being made here for the correction of a rather common condition. But to one who has seen the almost malignant proportions of tropical pterygia, such an effort, it is agreed, is demanded in order that a satisfactory functional result may be obtained. Also, when it is necessary to reoperate a recurrent pterygium, an operation similar to this one will conserve conjunctiva and prevent the development of a symblepharon such as was described in the beginning of this article.

CONCLUSIONS.

Within the limits of the number of cases corrected, this operation has proven quite satisfactory for the most severe types of pterygium. It is also satisfactory for the slight to less severe cases. There have been no recurrences after this operation, within a period of eight months. The technic is simple but it does demand accurate work, both in making the incisions and in placing the sutures.

The success of the operation seems to depend upon three factors; the first is the fact that the direction of the fibers of the pterygium is now changed, from their original horizontal to a perpendicular course; the second depends upon the atrophy of these fibers and the blood vessels, with scar tissue replacement and deposition, and the prevention of the later development of a pterygium thru this network of connective tissue fibers; and the third is because of the rectangular scar, the two vertical lines being the most important, which now lie interposed between the canthal angle and the corneal limbus, i.e., in the path a recurrent pterygium would have to take. *Camp Gaillard.*

MIKULICZ' DISEASE.

J. F. HARDESTY, M.D.

ST. LOUIS, MO.

The leading characteristics of this pathologic condition are described. A case is reported under observation for two years in which different diagnoses were made with microscopic examinations of tissues removed. The course of the case seemed to show it should properly be classed under this title. Read before the St. Louis Ophthalmic Society, January 29, 1926. See p. 545.

De Schweinitz defines Mikulicz' disease or syndrome as a symmetric enlargement of the lacrimal and salivary glands. Osler describes it as a remarkable affection in which the lacrimal and salivary glands are simultaneously enlarged and the etiology unknown.

The condition often begins in one lacrimal gland and develops slowly. Within a short time the other gland undergoes similar enlargement and this in turn is usually followed by enlargement of parotids and other salivary glands, giving the complete picture. Some cases terminate fatally in one or two months and others recover without treatment after a long period. As the condition progresses the eyes become dry from lack of tears and the involvement of the salivary glands gives a dry mouth. The condition is non-inflammatory and is confined to the glands of the head. The histologic picture is that of lymphoma and from the enlargement of the outer portion of the upper eyelid we get a peculiar drooping, "the bloodhound eye."

Lacrimal gland tumors are best described by Laura A. Lane, AMERICAN JOURNAL OF OPHTHALMOLOGY, 1922, volume V., p. 425, who has the following to say, "Lacrimal gland tumors are rare—only 229 cases reported in 323 years and the death rate is high 12.63%, while recurrence after removal is nineteen out of ninety-five cases."

It might be well to sketch briefly the development and anatomy of the lacrimal gland. It begins to develop in the third month of fetal life—the connective tissues, vessels and follicles from the mesoblast and the alveoli from the epiblast. There is a large superior lobe and a small accessory gland—the in-

ferior lobe, between which is the tendinous expansion of the levator palpebrae. Both parts show serous type of tubular structure. The superior lobe possesses some twelve ducts which unite and pass into an inferior portion. The gland measures 20 to 25 mm. transversly, 12 to 15 mm. anteroposteriorly, and is 5 to 6 mm. thick. It is located deep within the upper outer portion of bony orbit, has no capsule and is not closely covered with periosteum. It possesses adenoid tissue and the nerve supply is from the fifth cranial nerve with a few fibers from the seventh.

Fig. 1. Section thru part of the lymphoma, showing: L, lobules of small lymphocytes; S, skin of upper eyelid.

Tumors of the lacrimal gland are best described as mixed tumors and divided into the following classification: (a) Cystic dilation of one or more ducts. (b) Enlargement due to tuberculosis, syphilis and Mikulicz' syndrome. (c) Neoplasm, mostly endothelioma, epithelioma and sarcoma.

Zentmayer reports one tumor of the lacrimal gland known to have existed eighteen years, with three recurrences following operation, and the patient alive at eighty years of age. In children these tumors are nearly always rapidly fatal. Of 112 cases Lane gives the average age, 39 yrs., and average duration, 3 yrs. Gland involved, right 20, left 30, both 8. Not stated, 54. Recurrence, 20%.

Mikulicz' syndrome may be considered in four types:

1. Symmetric enlargement of lacrimals and one or more pair of salivary glands in which no lymphatic disturbance or blood changes are found.

2. Same as above with the addition of a reduction of hemoglobin and some lymphatic enlargement, giving picture of pseudoleukemia.

3. Symmetric enlargement of the lacrimal and salivary glands together with enlargement of all lymphatics and in addition the liver and spleen are involved. In this type profound blood changes occur with great leucocytosis. This type develops rapidly into a fatal true leucemia.

4. Benign condition of type one may pass to the true leucemia and death result in two months.

Pathology of Mikulicz' syndrome. Growth freely movable and confined to the gland. Hyperleucocytosis of gland causing a sclerosis and destruction of the gland tissues.

Mrs. L. H., 74 years old, first seen April, 1924, with tumor mass of the left lacrimal gland; lobulated and history of slow gradual growth. One of the lobules was removed for diagnosis, and the pathologic report was "hyperplastic lymph glands." The patient returned December 26th, 1924, for complete removal, as the mass interfered with the vision. At this time, December 26th, 1924, an attempt was made to remove the entire tumor growth but no effort was made to take the sur-

rounding tissue. On microscopic examination of the tumor at this time, it was called small round cell sarcoma by an able pathologist. (January 27th, 1925.) The patient was seen again in March, 1925. At this time there was a small nodular mass at the outer end of the operative scar, appearing benign and not attached to the periosteum. The fellow gland was beginning to enlarge but no other glandular involvement could be made out. In view of from the anterior right temporal region carried into place for new eyelid.

January 27th, 1926. No palpable tumor left orbit. Tumor right orbit slightly increased in size. Left eyeball restricted in movements, due to plastic flap being attached to globe area where no lining existed. Palpable lymph node mass in left deep chamber of neck, under sternocleidomastoid muscle. One distinctly large palpable lymph node, right axilla."

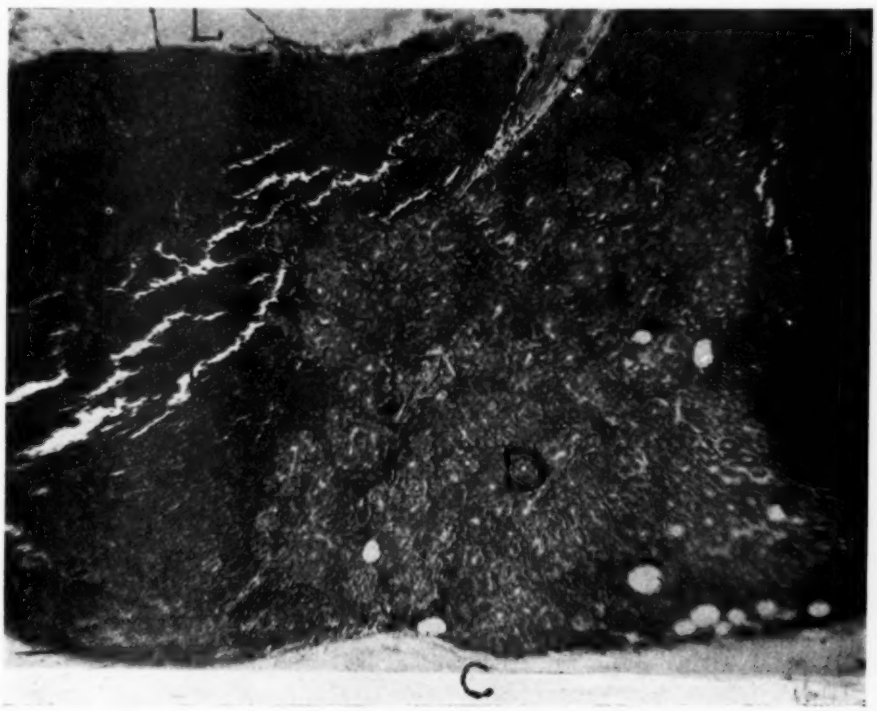

Fig. 2. Section thru one of the lobules of the lyphoma, showing: L, dense mass of small lymphocytes; C, connective tissue capsule of lobule; D, acini of lacrimal gland.

the diagnosis of malignancy the patient was referred to Dr. Landree and complete exteneration of the orbit was contemplated. At the operation March, 1925, however, a compromise operation was done (because of the involvement of the other eye the condition was felt to be nonmalignant in spite of the pathologic diagnosis) by Dr. Landree and described by him as follows:

"April 10th, 1925. Operation. Lacrimal gland right and tumor, and outer third or almost one-half upper eyelid, removed en masse. Plastic flap

Section of tissue removed at last operation described by Dr. Lamb as follows: "Section shows a dark staining lobulated mass, covered at one end by normal skin, including at this end a part of the upper eyelid, apparently unchanged.

The lobules of the growth vary greatly in shape and size, being roughly round, oval, square or triangular adjoining lobules show an adaptation or modeling of surfaces to each other. The lobules are composed almost entirely of dense compact masses of small lymphocytes. The nuclei only of

the lymphocytes are seen, and these stain less darkly than the ordinary inflammatory small lymphocyte, and show a few fine dark staining granules. For the most part, no intercellular substance or reticulum can be made out, altho here and there a few fine fibers are seen between the lymphocytes. In most places a connective tissue capsule lies around the lobules, altho it varies greatly in thickness and density. Some of the lobules show varying amounts of connective tissue trabeculae, the continuation of which with the capsule is evident in some places. Much of the connective tissue in these trabeculae shows hyalin change. A few blood vessels are seen, mostly small arteries, whose walls frequently show hyalin change and the endothelium shows proliferation. A few of the lobules show varying amounts of lacrimal gland acini; either a few scattered acini imbedded in lymphocytes, or groups of acini lying either at the margin or inside of the lobule; sections of lacrimal gland ducts are rarely made out.

Diagnosis: Lymphoma. Mikulicz' disease because coming on other side in symmetric position.

On June 24th, 1925, the eye was immovable and the lens somewhat cloudy, giving poor view of the fundus, but the disc appeared swollen. At this time the tumor of the right eye was considerably increased in size. November 18th, 1925, a poor view of the fundus shows apparent atrophy of the optic nerve. The eyeball still immovable. Vision 16/100 which could be accounted for by lense changes. Still no other gland involvement except fellow gland.

Patient was in two days ago, January, 1926, since the above was written, and the condition is much the same. There is in addition some enlargement of the sublingual glands and some enlargement of other glands of the neck anteriorly. Patient now complains of dryness of the mouth. The conjunctiva of the upper lids has undergone a peculiar hyperplastic degeneration somewhat resembling the cut surface of liver.

1021 *Missouri Building.*

CARCINOMA OF THE LEFT ORBIT.

C. A. Veasey, M.D., and C. A. Veasey, Jr., M.D.

SPOKANE, WASHINGTON.

This was an unusually large tumor which had started on the eyeball, seventeen years before. There was erosion of the nasal side and floor of the orbit; but no other evidence of extension. The orbital contents were removed and the antrum curetted. Two weeks later radium was employed. In six weeks the seat of operation was almost healed. Read before the Pacific Coast Oto-Ophthalmological Society, April, 1926.

Orbital carcinoma is by no means so infrequent as to demand a report of each isolated case; yet there are instances in which some of the features are so unusual that a single report may prove instructive. It is believed that the following case possesses a sufficient number of interesting points to place it in the latter class.

W. B., a male, farmer, aged 75 years, first consulted us on October 13th, 1925, because of an enormous growth in his left orbit. The family history was negative. No evidence of tumors or hereditary affections of any kind could be elicited. According to the patient's statement, some sort of a growth was observed first on the left eyeball in 1908, following a slight injury. This he assured us would disappear and return, so that nothing was ever done for it. In all probability this was a papilloma.

Approximately a year before consulting us this growth, whatever it may have been, began to increase rapidly in size and in a few months the visual acuity was entirely abolished. Even then it was not his intention to seek medical advice until persuaded by some of his neighbors who brought him to our office.

The picture he presented at the time of our examination was somewhat startling. The right eye, excepting for a refractive error, was normal. Nothing whatever could be seen of the left eye because the lids were swollen shut.

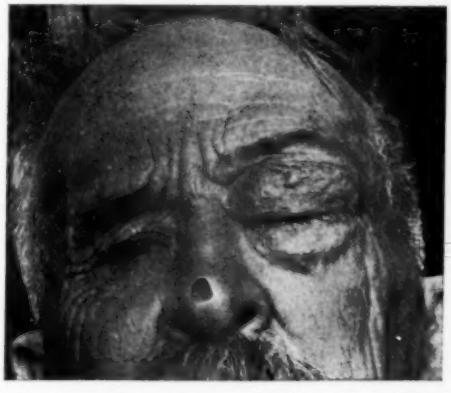

Fig. 1. Appearance presented at first visit, October 13, 1925.

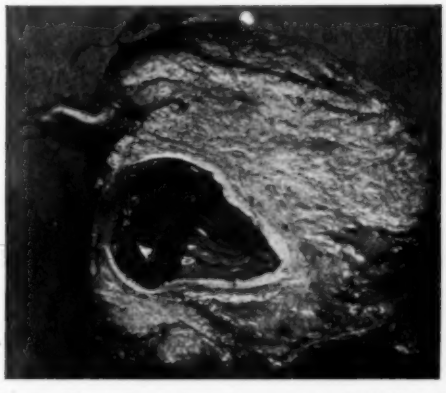

Fig. 2. Vertical section thru tumor, including left eyeball and upper lid.

The palpebral fissure was entirely obliterated. The vessels of the lids were enormously distended and tortuous and the lids themselves were thrust forward in a more or less rounded mass because of the tremendous size of the growth and the pressure from behind. Upon forcible separation of the lids nothing whatever of the eyeball could be seen, excepting a tiny excoriated portion of the cornea about three millimeters in diameter, the result of an old perforating ulcer into which the iris had become incarcerated. The remainder of the eyeball was entirely covered by a tumor mass in which it was as firmly embedded as any object frozen in a block of ice and this tumor mass occupied the entire orbital cavity. In the outer two-thirds of the upper lid a flat thick growth could be felt, not observable either on the skin or mucous membrane surfaces, and this could be distinctly followed backward by the fingers until it terminated in the tumor mass within

the orbit, being directly connected therewith. The anterior portion of this huge growth, in which the eyeball was firmly embedded, could be grasped with the fingers and palm of the hand thru the permanently closed lids, and was practically immobile. The whole cavity was filled and the mass was exceedingly hard, tho the patient complained of no pain; nor did he experience any discomfort from the manipulation of the examination. Vision, of course, was entirely abolished.

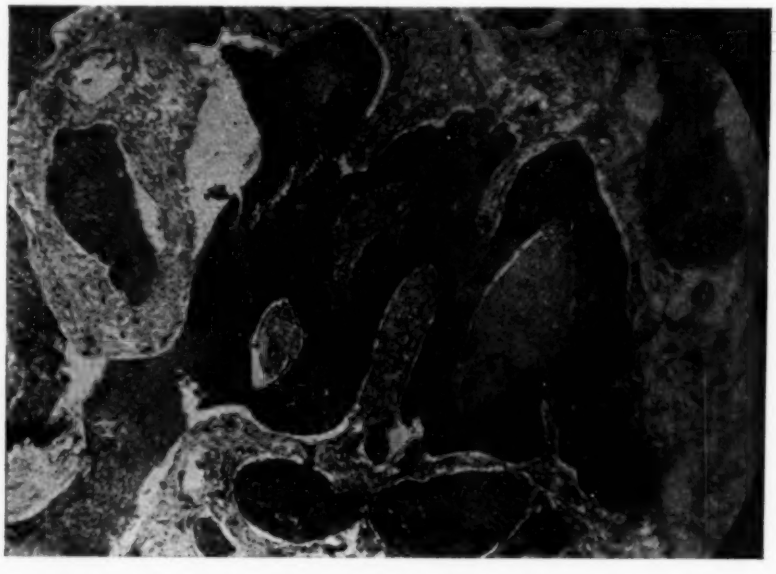

Fig. 3. Microscopic section of growth, showing islands of closely packed tumor cells, separated by loose connective tissue.

The nasal examination revealed nothing abnormal in either naris, tho both antra were dark by transillumination. Skiagraphs did not show any involvement of the nasal accessory sinuses excepting a possibility of some erosion of the bone on the nasal side and the floor of the orbit. No metastasis could be felt in the neck or beneath the arm, nor could any involvement of the liver be detected by palpation. The blood Wassermann and the urinary examination were negative. The blood chemistry was as follows: Sugar 117.6; Urea nitrogen 20; Nonprotein nitrogen 37.5; Creatinin 1.3.

OPERATION. Under gas anesthesia the orbital contents were exenterated. The tumor mass in the upper lid was first dissected backward until its connection with the orbital mass was reached and then the orbital contents were removed in the customary manner by dividing the periosteum at the orbital margins working backward to the apex of the orbit and making the final division with a stout pair of curved scissors. Thus the whole growth, including the palpebral portion, was removed *en masse*.

It was now found that the floor of the orbit was eroded thru to the antrum. The necrotic bone was excised and a lot of hypertrophied material curetted from the antrum cavity, which subsequent examination proved to be chronic inflammatory tissues. Spots of erosion also were found in the orbital plate of the ethmoid and these were cleaned up by curettage. The lids were sutured, closing the palpebral fissure excepting for a small opening at the nasal angle thru which the orbital cavity and antrum were packed with iodoform gauze. The packing was changed daily for a time and subsequently left out entirely, the cavity being kept clean with irrigations of potassium permanganate.

Two days after the operation the pa-

tient developed some pulmonary disturbance which sent his temperature to 104° with mild delirium, causing us to think of meningitis, but all the neurologic symptoms of meningitis were absent and the findings from the spinal puncture were negative. The following day the pulmonary condition had so far developed as to be unmistakable and in a week these symptoms had entirely disappeared.

Two weeks after the exenteration radium was employed. It was not used earlier because of the patient's weakened condition. One hundred milligrams, screened with one and one-half mm. of brass and rubber were placed as near the central portion of the orbital cavity as possible, to be equidistant from all the surrounding areas, and kept in situ for seven hours. There was a distinct chill the same evening, which may have been only coincident, as there seemed to be no further trouble nor any visible reaction at the time or later.

In one month from the date of the operation the patient was permitted to go to his home, with instructions to irrigate the cavity once daily with 1-2000 potassium permanganate solution. This solution at the time of his leaving went thru the antrum into the nose at each irrigation. The granulations were healthy and the bone was almost entirely covered.

Two weeks later the patient returned for observation and the whole orbital cavity excepting an area about 1 cm. in diameter over the orbital plate of the ethmoid was entirely covered with what appeared to be smooth, healthy granulation tissue and the patient's general condition was good.

PATHOLOGIC REPORT BY DR. ROBERT F. E. STIER.

Gross: The specimen consisted of an enuculated eye with the immediate adnexa and measured 5x5.5 cm. The external surfaces were roughened by many fibrous and fatty tags and in them there were some smooth nodules. These were more prominent in the outer portion of the upper lid which was almost completely replaced by one smooth homogeneous nodule. This latter upon section had a mottled appearance and was made up of islands of grayish tissue separated by lighter pink appearing areas. Upon section the eyeball contained clear vitreous and the lens was opaque. The eyeball was much smaller than normal and of irregular shape, due to the compression of the tumor mass by which it was surrounded. Infiltrating the external coats and making up almost the entire mass there was a tissue as described above. The only fatty tissue ob-

Fig. 4. Microscopic section of tumor under higher power. Epithelial cells basal type having oval nucleus and prominent nucleolus.

servable was in the region of the optic nerve. Upon section some of the tissue presented an appearance comparable with pancreatic tissue.

Microscopic: Sections removed from all portions of the tumor mass presented practically the same appearance, which consisted of islands of closely packed tumor cells separated by varying amounts of loose connective tissue in which there were fibroblasts separated by lymphocytes, polymorphonuclear leucocytes and some eosinophiles. In addition there were some thin walled congested blood vessels. The islands of tumor cells were made up of epithelial cells that varied considerably in their size, shape and staining qualities. As a rule they were of a flat basal like type having an oval nucleus with a prominent nucleolus and were vesicular staining, but considerable number of hyperchromatic nuclei were scattered among them. A considerable proportion of mitotic figures in all stages of division were present. The central portions of some of these islands were widely dilated and filled with a necrotic fibrin, nuclear fragments, polymorphonuclear leucocytes and some necrotic tumor cells. No definite glandular structures could be observed. Some of the islands were of typical basal like cells but it was not possible, from the microscopic sections to determine the primary origin of the growth. Diagnosis: Medullary carcinoma of the basal cell type.

COMMENT.

Many cases of orbital carcinoma having their origin either in the conjunctiva or the eyelids have been recorded yet there are by no means common. De Schweinitz and Shumway[1] in reporting a case before the American Ophthalmological Society state that Rachanitzin in 1908 searched the literature in the Jahresbericht and found 502 cases of conjunctival tumors of which 250 were benign and 252 malignant. Of the malignant tumors 149 were carcinomas and 103 were sarcomas. The youngest case in which epibulbar carcinoma was observed was twenty months of age. The literature of the subject prior to 1904 may be found in Saemisch's article on "Diseases of the Conjunctiva" in the second edition of the Graefe-Saemisch Handbuch der gesamten Augenheilkunde[2] and from 1904 to 1910 in an article by Heilburn in Graefe's Archiv f. Ophthalmologie[3]. To these recorded cases de Schweinitz and Shumway added a few and a small number have been since recorded.

It has been found that perforation of the eyeball occurs in about 37.6% of the cases studied and that a growth situated in the anterior portion of the globe or in the neighborhood of the corneal limbus is more apt to penetrate than one further removed therefrom. These facts of course are all important in determining the proper operative procedure in any given case while the tumor is yet small. The further the growth is situated from the corneal limbus the less likely is it to recur after excision. Of course it is understood that no malignant growth should be excised from the eyeball unless the patient can be kept under observation.

A practical point as demonstrated by de Schweinitz in another case[4] is that a carcinoma may follow the removal of a benign growth tho several years may intervene. In the case referred to he removed a papilloma from the corneoscleral margin which had occurred a few years after an injury to the eyeball and with complete recovery so far as could be observed. Nine years later the orbital contents were exenterated for carcinoma.

The interesting points in connection with our case are:

1. The size and extent of the growth before any relief was sought by the patient.
2. The remarkable compression of the eyeball, it being almost entirely buried in the carcinomatous mass.
3. The destruction of the bone on the floor and nasal wall of the orbit, evidently thru direct pressure.
4. The excellent recovery, even tho it should be only temporary, in a patient seventy-five years of age.

404 *Paulsen Bldg.*

REFERENCES.

1. Trans. Amer. Ophthal. Soc., 1913.
2. Vol. V, p. 677.
3. Bd. LXXVII, 1910, p. 541 (quoted from de Schweinitz and Shumway).
4. Amer. Jour. Ophthal., Feb., 1921, vol. IV, No. 2.

ORBITOFACIAL ANEURYSM.

G. William Schlindwein, M.D.

ERIE, PA.

A man of 54 with a vascular tumor involving lids and orbit had suffered a head injury when 14. A year later the vessels in the neck were tied with benefit but the tumor increased until he sought relief from great pain. Operation followed by packing relieved pain and produced great improvement.

This case is reported on account of the rather unusual clinical appearance, as well as its infrequent occurrence in ophthalmology, and may be classed under the group of "Pulsating Exophthalmos," as described by de Schweinitz and Holloway in their complete monograph published in 1908.

On June 22, 1925, Dr. F. A. Walsh of this city referred to me, Wm. I—, farmer, age 54, with a massive swelling on the right side of the forehead and extending beyond the middle line so as to partially obstruct vision in the left eye. The mass was irregular, non-fluctuating, almost the consistency of a solid growth with corrugations extending as far back as the occipito-parietal suture, resembling as expressed by the patient, "small corn cobs." The superficial veins of the nose were prominent and dusky, the right eye was pushed down and out but pointed inward, and there was no nasal discharge nor evidence of accessory sinus disease. X-rays taken by Dr. Putts were reported as follows:

"A large mass of soft tissue is seen extending in front of upper part of nose and frontal sinus region in which can be seen some calcification, suggesting the presence of a venous angioma. No evidence of disease of sinuses could be determined, altho clouding is seen which can be accounted for by the mass present and the swelling of tissues in region of right orbit." Further study of the plates showed the right orbit very much larger than the left, probably 50% greater area.

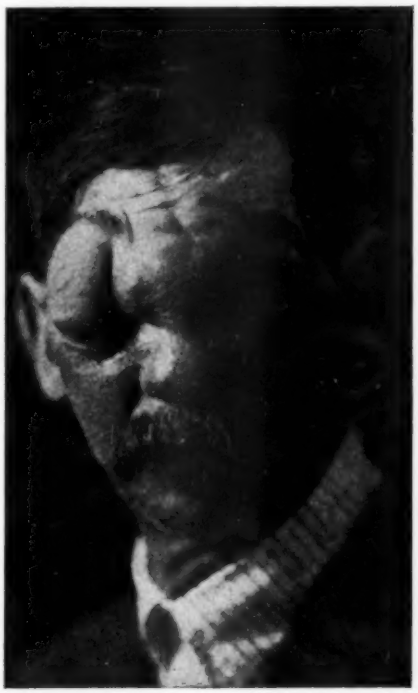

Fig. 1. Tumors seen from front.

Fig. 2. Seen from right side.

History. Father died at age of 86 of

senility. Mother died at age of 90 of senility. Patient is the youngest of a family of 7 children, all of whom are living except one sister who died at the age of 32 of typhoid fever. Has had the ordinary diseases of childhood, one attack of "grippe" but no other diseases.

Fig. 3. Appearance of patient at 15.

Present Trouble. On Decoration Day, 1886, when 14 years of age, was thrown with great force against a barn by an infuriated bull, crushing his head against the building. He managed to walk about one block but was more or less in daze. Accident happened about 8:00 a. m. and his mental condition was more or less confused until after dark. There was free bleeding from nose, mouth and ears and he was confined to bed about three weeks, suffering from severe head pains during that time.

One year later, in 1887, he went to Cleveland, where Dr. Weber performed an operation on the right side of the neck, ligating a vessel, on account of the swelling of the blood vessels on his forehead and near the right eye. (This condition is shown by illustration No. 3, taken from a photograph just previous to the operation.) Patient states that the surgeon tied off the jugular vein.

There was some relief following this operation, the swelling diminished but there was still present some throbbing

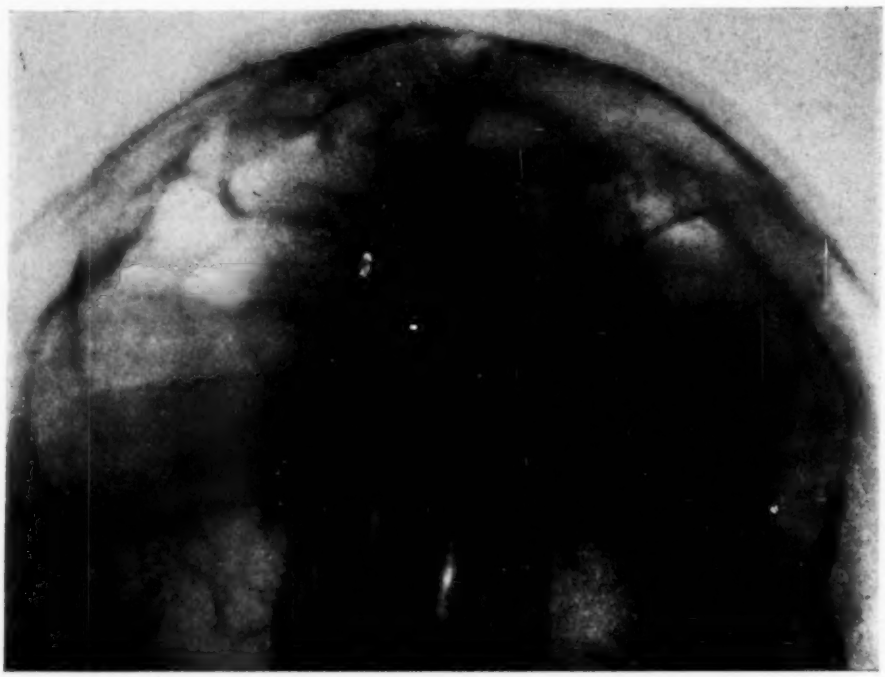

Fig. 4. X-ray of sinuses and orbit from above.

and pulsation. He has always had noises in his head and ears since the injury and has considerable impairment of hearing on the right side.

The right eye, as shown by figure 3, was not deviated inward at the age of 15 years, but has gradually assumed a paralytic inward squint. There is no vision in this eye, the lens is cataractous and no movement of any extra-

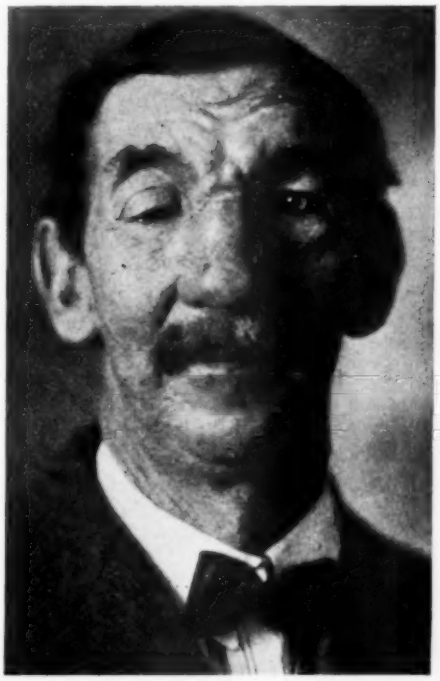

Fig. 5.

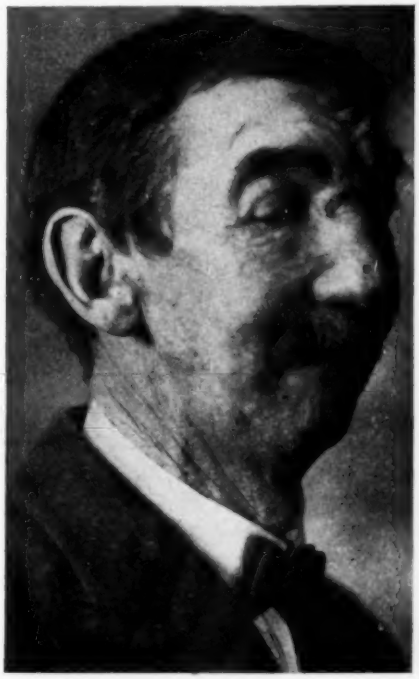

Fig. 6.

ocular muscles. The left eye shows a distinct cupping and has a tension by McLean tonomotor of 35 mm., and vision of 20/20. Field only slightly contracted.

The patient stated that about one week before consulting me, the swelling increased suddenly and assumed a much larger size than usual, with pains in his head that became so intense that he could not sleep.

The history given by the patient was very definite regarding the etiology and there seemed to be no reason to doubt that we were dealing with a large venous aneurysm involving the orbital and facial branches. However, there was no pulsation on palpation, the masses everywhere resembled solid tissue and consideration was given to the possibility of neoplasm superimposed on the aneurysm. There was no Wassermann test made.

The patient begged for relief from his intense pain and suffering and consented to any procedure that would give some assurance of improvement. The case seemed hopeless because even after removal of clotted blood I still had to deal with the danger of hemorrhage, probably from the cavernous sinus. The dangers and risks were explained to the patient and relatives and consent to operation freely given.

On June 29, 1925 at St. Vincent's Hospital, under ether administered by Dr. J. Elmer O'Brien, assisted by Dr. J. H. Fust, I made an incision about an inch above the brow, found an eroded area of the frontal bone about one inch diameter, then entered a large cystic cavity filled with masses of clotted blood. This was all removed and followed by free venous bleeding from the bottom of the cavity: the stream seemed to be about the volume that comes from an open lateral sinus. Hemorrhage was controlled by iodo-

form gauze packing, reinforced by two heavy sutures in the wound.

Packing was carefully removed, beginning on the fifth day. There was some infection with drainage of pus from the wound and also from one of the large masses over the root of the nose.

Since that time there has been a gradual disappearance of the nodular masses on the vertex of skull and on forehead. The swollen conjunctiva, which at one time projected over the lower lid for more than an inch, has resumed a normal position and appearance.

At present patient is entirely free from all pain, no subjective pulsation and only slight tinnitus.

138 *West Ninth Street.*

CHANGES IN REFRACTION IN DIABETES MELLITUS.

LAWRENCE POST, M.D., F.A.C.S.

ST. LOUIS, MO.

The story of osmotic changes in the lens, due to change in the sugar content of the blood, is briefly stated. Two cases of the kind are reported: The first patient became suddenly myopic; when placed on a diabetic diet became again hyperopic. The second patient became hyperopic a week after going on a diabetic diet. Later the patient returned to her old glasses. Read before the St. Louis Ophthalmic Society, March 26, 1926.

It has been known for many years that changes of refraction occasionally accompany diabetes mellitus. More frequently the tendency is towards the development of myopia, less frequently hypermetropia.

Duke-Elder[1] has collected and analyzed 45 cases and added 3 more. He has also advanced an hypothesis. To discuss this in its relation to the two new cases which are here recorded, is the purpose of this paper.

Stated briefly the hypothesis is that "The refractive power of the eye tends to vary directly as the sugar content of the blood; that is there is a tendency to hypermetropia with decreased sugar, with increased sugar to myopia."

The author locates the seat of the changed refraction in the lens. The most convincing argument for this is the case reported by Elschnig[2] in which an aphakic eye of a diabetic showed no change of refraction while the normal eye did show a marked change. In this case at least, there seems no doubt of the location of the lesion.

Duke-Elder concludes that "The phenomenon is due to osmotic processes involving the lens, caused by a variation of the molecular concentration of the blood and tissue fluids with the sugar content and that there is a tendency to return to normal on the establishment of metabolic stability."

To quote further, "As the sugar content rises, therefore, the molecular concentration of the blood and tissue fluids falls. The lens, which we have already assumed to be peculiarly resistant to change, remains in statu quo, and is thus bathed by a fluid at a tension lower than its own molecular state; osmotic forces are set up, and to obtain equilibrium, fluid flows from the lower level to the higher, that is, into the lens, deforming it and making the eye myopic. The increase of refractive power may be accentuated by a decrease in the index of refraction of the cortical layers as opposed to the harder and more resistant nucleus, by dilution thereby making the index of the whole lens less uniform and therefore of a higher refractive power.

Conversely, on a fall of blood sugar, a reverse osmotic change occurs, and some degree of hypermetropia is produced by the transference of fluid from the lens to the surrounding tissues and blood, whose osmotic pressure is now raised."

Case 1. L. B., female, aged 45 years. Complaint. Rapid failure of vision yesterday so much that the figures on the blackboard which could be clearly seen in the morning were hazily seen by afternoon. The fogging was equal in each eye.

The patient was examined for the first time on the following day, May 22, 1925. Lenses and fundi were nor-

mal. The interesting feature was the refraction.

The patient was wearing: O.D. + 0.75 cx. 105°; O.S. + 0.75 cx. 120° with a + 1.50 sphere added for near. These glasses had been prescribed one year previously and had been entirely satisfactory until yesterday.

Refraction on May 23rd was: O.D. —1.50 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. — 1.50 Sph. ⊃ + .75 cx. 110° V. = 20/15, an addition of + 1.50 sphere gave vision of 3½ point type at 14 inches.

The general physical examination was made by Dr. Walter Fischel who found a large amount of sugar in the urine. The patient was put on a diabetic diet.

May 29th. Only a faint trace of sugar was found in the urine.

May 30th. Patient noted that the distant vision had cleared and that she could no longer read without glasses as she had been able to do since the onset of the visual disturbance. Evidently the myopia was disappearing.

June 6th. Refraction was: O.D. + 2.00 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + 1.50 Sph. ⊃ + 1.00 cx. 100° V. = 20/15. Not only had the myopia disappeared but two diopters of hypermetropia had been added to the normal refraction. This was a total change of 3½ diopters. The blood sugar on this date was 0.261.

We do not know whether the blood sugar had been higher than this. But we do know that the increase in hypermetropia had followed the decrease of urinary sugar.

June 8th. Four units of insulin were given.

June 9th. Ten units of insulin were given.

June 11th. Eight units of insulin were given.

June 13th. Refraction was: O.D. + 1.00 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + 0.75 Sph. ⊃ + 1.00 cx. 110° V. = 20/15.

The urine was sugar free.

Blood sugar was 0.142.

June 27th. Refraction was: O.D. + 0.75 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + 0.25 Sph. ⊃ + 1.00 cx. 110° V. = 20/15.

Urine was sugar free.

Blood sugar was 0.154.

July 6th. Refraction was: O.D. + .50 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + 1.00 cx. 110° V. = 20/15.

Urine was sugar free.

Blood sugar was 0.1350.

For three weeks the blood sugar had remained constant and the refraction had slowly returned to normal.

August 28th. Urine showed much sugar and the blood sugar was .2526. Insulin had been discontinued during July and August and the diet had not been followed strictly during these months.

Sept. 2nd. Refraction was: O.D. — .25 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. — .75 Sph. ⊃ + .87 cx. 110° V. = 20/15. This myopic increase followed the increase in blood sugar.

Sept. 8th. Ten units of insulin were given daily until Oct. 31st since when fifteen units have been given daily.

Sept. 26th. Refraction was: O.D. + 1.00 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + .50 Sph. ⊃ + .87 cx. 110° V. = 20/15.

Blood sugar was .2050.

October 10th. Refraction was: O.D. + .75 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + .25 Sph. ⊃ + .87 cx. 110° V. = 20/15.

Urine was sugar free.

Blood sugar was .1904.

Nov. 7th. Refraction was: O.D. + .50 Sph. ⊃ + .37 cx. 105° V. = 20/15; O.S. + .87 cx. 110° V. = 20/15.

Urine was sugar free.

Blood sugar was 0.1406.

Again the refraction was normal as the blood sugar reached the level which appeared to be fairly constant for this patient.

Case 2. B. B. female, aged 52 years.

The patient was referred by Dr. Wm. Olmsted who first saw her on Feb. 18, 1925, at which time she had had intermittent treatment for diabetes for one year.

Blood sugar was 0.2244.

Urinary sugar was ++++.

Strict diabetic diet was prescribed with a reduction of the urinary and blood sugar.

Feb. 19, 1925. Urinary sugar was +.

Feb. 20, 1925. There was no sugar in urine.

Feb. 23, 1925. There was no sugar in urine.

Feb. 14, 1925. Blood sugar was 0.1454.

Feb. 28, 1925. Patient referred by Dr. Olmsted because she had noted that for the past three days she could not see to read with her glasses which had been satisfactory up to that time. She now could see better at distance thru the reading segments than with the distance correction. Glasses were: O.D. and O.S. + 1.37 Sph., and for reading: O.D. and O.S. + 3.50 Sph.

The refraction was: O.D. + 2.75 Sph. V. = 20/15; O.S. + 3.25 Sph. ⌒ + .25 cx. 180° V. = 20/15. This was increased hypermetropia of 1.37 in one eye and 1.87 in the other which had occurred one week after active treatment, which caused a great reduction in blood and urinary sugar, was begun.

March 3, 1925. Blood sugar was 0.1244.

March 4, 1925. Refraction was: O.D. + 2.75 Sph. V. = 20/15; O.S. + 3.00 Sph. ⌒ + .25 cx. 180° V. = 20/15 and 3½ point type was read with + 2.00 Sph. added.

March 13, 1925. Blood sugar was 0.119.

March 18, 1925. Refraction was: O.D. + 2.75 Sph. V. = 20/15; O.S. + 2.50 Sph. ⌒ + .25 cx. 180° V. = 20/15.

April 14, 1925. Refraction was: O.D. + 2.25 Sph. V. = 20/15; O.S. + 2.00 Sph. ⌒ + .25 cx. 180° V. = 20/15. The refraction was slowly returning to normal.

Nov. 15, 1925. Patient wrote that she had returned to her old glasses which were again perfectly satisfactory.

Each of these cases is typical of refraction change in diabetes mellitus, in several particulars. In the first place the changes came on rapidly. In the second, the patients were in the period of life in which changes in the lens are most frequent.

For a long time in case 1 and an unknown period in case 2, the refraction balance was maintained but this was disturbed in case 1 by the diabetes itself with development of myopia and in case 2 by treatment, which caused a sudden decrease in the sugar content of the tissues with the development of hypermetropia.

In each case an increase of sugar was followed by an increasing myopia or decreasing hypermetropia while the sudden reduction of sugar was followed by a decreasing myopia or an increasing hypermetropia.

Each case showed a tendency to return to the original refraction after the sugar balance was again established.

Thus, the two cases here recorded support in every particular, the hypotheses of Duke-Elder as outlined at the beginning of this report.

520 *Metropolitan Bldg.*

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LEPTOTRICHOSIS OF THE CONJUNCTIVA.

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Two cases of "Parinaud's Conjunctivitis," occurred in a brother and sister. The lesions were typical, and contained the leptothrix described by Verhoeff. The patients had been in close contact with a cat that had sore ears. Both patients recovered.

Leptotrichosis Conjunctivae, or Parinaud's Conjunctivitis, is a subacute inflammatory process of the conjunctiva due to infection by a leptothrix. It is characterized by enlargement of the preauricular gland. Very often other nearby glands are also involved. The conjunctival lesions consist of small grayish areas 1/2 mm. to 4 mm. in diameter, situated just beneath the epithelium. These areas are infiltrated with endothelial phagocytes undergoing necrosis and contain the leptothrix in large numbers. Beneath these areas there is a formation of granulation tissue causing polypoid projections of the conjunctiva.

The disease was first described clinically by Parinaud in 1889. No histologic study was made and it was not until 1904, when Verhoeff and Derby[1] reported a case, that certain distinctive histologic features were described by Verhoeff. Bernheimer[2] in 1906 confirmed these observations. In 1913 Verhoeff[3] reported a series of twelve cases and discovery of the organism. In 1918 he[4] added six more cases and published a resumé of the eighteen cases he had studied. The leptothrix had been found in all the cases except one, where there was insufficient material saved. Animal inoculations and cultures were unsuccessful whenever tried. In 1924 Lemoine[5] reported a case in which he found the conjunctival lesions and organisms described by Verhoeff.

In Verhoeff's series the average age was eighteen years. Males predominated over females in the ratio of 14:4. The seasonal incidence was interesting, thirteen cases out of a total of eighteen occurring in the months of November, December, and January. Altho cases did occur in the summer, it was distinctly a cold weather disease. A history of slight trauma was obtained in four cases. In three cases there was history of animal contact, but in every case the animal in question was free from any known disease. The disease was always unilateral and in no instance was a case known to have been associated in any way with another case of the disease.

The following two cases are reported because: (1) They are the first instance, I believe, of two cases occurring in the same family at the same time, the patients being brother and sister. (2) There was definite history of contact with a diseased animal.

Case I. Harold M., age 14, was first seen by me on December 24, 1925. Two weeks previously he had received a slight cut at the outer canthus of the left eye from the sharp edge of a paper being drawn across his face. Three days later he noticed that the left eye felt sore and irritated. There was slight mucoid discharge. At the same time he noticed a painless swelling in front of the left ear. Treatment at home consisted of boric acid wash. The gland became larger and somewhat tender. Examination showed the lower lid swollen and edematous, with slight mucopurulent discharge. From the fornix below there protruded a rather large nodule of conjunctiva, containing a yellow gray top. The rest of the fornix was edematous and showed some follicle formation. On the upper lid were several polypoid granulations. The bulbar conjunctiva was injected only at the lower temporal portion. The cornea was clear. Vision was 6/6. There was marked enlargement and slight tenderness of the preauricular and anterior cervical glands on the same side. Smear of conjunctival secretion was entirely negative. Constitutional symptoms were lacking. A diagnosis of Parinaud's conjunctivitis was made and the patient taken to Dr. Verhoeff's laboratory for excision and study of the nodule in the lower fornix. Dr. Verhoeff reported the typical histologic picture with leptothrices present in large numbers.

The only local treatment given was a zinc sulphate solution, 1/4 gr. to a 1/2 ounce of water every three hours. There was a rapid recovery and at date of present writing (six weeks from onset of disease) the lids present an entirely normal appearance, but there is still marked swelling of preauricular and other regional glands.

Case II. Dorothea M., age 12, seen the same time as her brother. Four days previously the left eye felt sore and the upper lid became swollen. Next day a swelling was noticed in front of the left ear. There was a slight mucoid discharge from the eye. Boric acid washes did not improve the condition. There were no constitutional symptoms.

Examination showed an inflamed edematous upper lid at outer canthus, similar to a beginning hordeolum but no tender point could be elicited. There was moderate enlargement of the preauricular gland. Upon everting the upper lid, there were seen several tabs of conjunctiva 2-3 mm. in length all along the lid. Near the outer canthus were two small, white, elevated areas about 1 to 2 mm. in diameter, bathed in mucopurulent secretion. The conjunctiva near the outer canthus was edematous back to the fornix. The bulbar conjunctiva was only slightly injected above. The cornea was clear. Vision was 6/6 both eyes. Smear of conjunctival secretion showed nothing of importance. The small white elevated areas were excised and prepared by Dr. Verhoeff. Numerous leptothrices were found with the typical histologic picture of Parinaud's conjunctivitis.

This case was put on mercurochrome, 1% solution every three hours, and made an uneventful recovery. At the present time (five weeks after onset) there remains only a slight injection of the conjunctiva in the upper lid, and a slight enlargement of the preauricular gland.

About two weeks before the onset of the disease in the boy, a cat had been taken into the household. It was noticed by the family that the animal had a small sore in each ear. In spite of this, the cat was quite a constant companion of the children, often sleeping in the bed with one or the other of them. This cat was brought to the laboratory and examined by Dr. Verhoeff and myself with the hope of finding leptothrices in the lesion, but unfortunately the sore ears were already healed and there was no tissue available for biopsy.

A study of these two cases brings up the question as to direct transmission from one individual to another, and also the possibility, after all, of animal contact being an important consideration.

Experimentally the disease has apparently been transmitted from man to animal by Wherry and Ray[6]. They report a supposed case of Parinaud's conjunctivitis in which pus aspirated from the preauricular gland was inoculated subcutaneously into a white mouse, producing an infection characterized by purulent conjunctivitis and death. Postmortem there was isolated from muscular abscesses a leptothrix, which grew only on egg medium, incubator under partial tension and anaerobic condition. In the same human case the organism was successfully cultured directly from pus of the gland. Unfortunately the conjunctival lesions of the patient were not examined histologically, so that it remains uncertain whether or not the case was actually one of Parinaud's conjunctivitis, and whether or not the organism was the same as that found by Verhoeff in the conjunctival lesions of his cases.

520 *Commonwealth Ave.*

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INTRAOCULAR GROWTHS IN CHILDREN.

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Three cases here reported illustrate the difficulty and importance of the diagnosis and management of intraocular tumors in children. In one a retinoblastoma (socalled glioma) was excised and the child remained alive and well two and one-half years later. In the second case a malignant growth was simulated by an anomalous condition, probably benign. In the third the sequels of an attack of probable meningitis were encountered. Read before the Pacific Coast Oto-Ophthalmological Society, April, 1926.

The discovery of the presence of unusual and abnormal structures within the eye of a child must always give us concern.

The three cases which are here detailed presented, in the course of their diagnosis and subsequent care, various phases of the problems that confront one when face to face with an unwonted and abnormal intraocular picture.

Observation I. A four months baby boy was brought with a highly inflamed left eye. For three days, the parents stated, the child had given indication of pain in this eye. The lids were puffy and red. The bulbar conjunctiva was chemotic and a slight mucopurulent discharge was present. The pupil was moderately dilated. The cornea was steamy, but not enough so to prevent the discovery of a yellowish reflex from some mass within the vitreous. Upon questioning, the parents stated that this "amber colored pupil" had been noticed since birth. Also, that they were quite sure that the child had never had vision in this eye. Had it not been, however, for the inflammation and pain that had ensued and drove them to seek professional help, it is doubtful when the real condition might have been discovered. Every indication pointed to the congestive stage of acute glaucoma. Tension by palpation was plus 2, confirmed a day or two later under ether, when by the McLean instrument tension in the affected eye registered between 34 and 40.

While under ether both eyes were examined ophthalmoscopically, with the discovery of a normal right eye, but confirming the diagnosis of glioma of the retina in the left. The trouble was apparently confined within the bulbus, and the eye by every available test, proving totally deficient in sight and even in light perception; it was enucleated. The sclera was found intact, the optic nerve normal in size and appearance.

The pathologist's report (Department of Pathology, U. of Oregon Medical School) states that the specimen is undoubtedly glioma of the retina. This child was seen as late as two and a half years following the enucleation. He was then in excellent health without a sign of secondary orbital recurrence, or of development of glioma in the other eye.

Observation II. This little girl was brought at the age of 14 months for the correction of a right internal strabismus (approximately a 40° squint) which had been noticed since the age of six weeks. At an even earlier time the parents' attention was called to the fact that the pupil of the opposite (left) eye differed from the other in color.

Upon examination by reflected light this eye showed immediately back of the lens a marked grayish opacity over the central one-third of the vitreous at the nasal side of the disc. A grayish mass, ill defined but running backwards and slightly upwards in a cord-like formation connected these two structures. The red retinal reflex and some apparently normal vessels were visible to the inner side of the gray mass. A diagnosis was made of posterior polar cataract with choroidal coloboma and persistent hyaloid artery. Six months later the appearance of this eye had changed but little. A dense bundle, cone shaped in appearance, the narrower portion anterior, could be seen gradually spreading toward the upper and central part of the retina.

In another four months the gray mass seemed to have increased in extent and density. It was no longer possible to see the choroidal defect or the fundus details. The vitreous to the nasal side of the growth, previously

relatively clear, now showed a somewhat flocculent, grayish cloud loosely connected with the denser central body of the growth, thru which only a reddish reflex was obtained. A single small blood vessel coursed over the denser gray mass. To eliminate every possibility of a malignant neoplasm an ophthalmoscopic examination under ether narcosis was made with two consultants. The above findings were confirmed, and we reassured ourselves as to the probable benign character of the growth.

But even with glioma ruled out, one's mind cannot be wholly at rest as regards this eye in recalling the quite evident change in appearance that had taken place within the ten months since the original examination. It is not at all impossible that a low grade hyalitis is taking place and that the picture may at any time be further modified. The child is still seen at frequent intervals.

Observation III. Bobby E., aet. 10, with physical and mental development of six years. The right pupil is small, oval, and displaced upwards, a congenital coloboma iridis. The left pupil is dilated ad maximum and the iris is definitely atrophic. He is without light perception in either eye, but each presents thru the pupil a golden-yellowish reflex, strongly suggestive of glioma.

The personal and family history was completely available. Up to the age of six months he had been a perfectly normal child. He then had what was supposed to be an attack of spinal meningitis. "Two or three of his convulsions lasted six hours." About two weeks later it was discovered that he was blind. Apart from this illness he has been an unusually well child. His parents are very definite in their statements that at no time in his life was either eye red or inflamed.

The intraocular tension is normal. There is no hyperemia of the conjunctiva. The adnexae oculi are normal. There is nothing to indicate that the growth, if such it be, has invaded other orbital tissues. A tentative diagnosis of glioma was made with the following reservation: If this is glioma the growth has remained quiescent for an unusually long period, viz., 9½ years.

This diagnosis being concurred in by consultants, double enucleation was advised, accepted and performed without delay. The specimens were sent to the Army Medical Museum and thru the courtesy of Major George S. Callender full reports were promptly received. The preliminary note stated that "gross examination indicated the presence of bilateral glioma."

The first sections, however, showed in the left eye: Peripheral anterior synechia with detached retina, with organization. No choroiditis or iritis present. A similar condition prevailed in the right eye but more advanced, with ossification of the choroid in about the region of the ora serrata. There is no indication of tumor formation as far as can be seen. The final report will be rendered after the material has been sent to a consultant pathologist. The case seems to be rather unusual."

The final report received a few days ago reads as follows: Left eye: Fairly broad peripheral synechia, separation of Descemet's membrane, one layer of cells partly covering anterior surface of iris. Canal of Schlemm present. Old complete detachment of the retina with vascular organization and disappearance of greater portion of retinal cells. The organized mass is attached at the ora serrata to the choroid. Behind the ora serrata the choroid shows marked increased vascularization with wide lymph spaces. Optic nerve shows marked atrophy.

Right eye: Picture is similar to that in left except that the choroid shows greater increase in fibrous tissue with ossification. Descemet's membrane does not cover any portion of the anterior surface of the iris.

Diagnosis: Congenital glaucoma with complete retinal detachment and organization of the detached retina.

Note: It is believed that the congenital condition was that of glaucoma with peripheral synechia and that the detachment of the retina gave opportunity to prevent buphthalmos by regulating the conditions within the eyeball. A proliferative retinitis was probably present early, essentially the picture seen in so called pseudoglioma,

the microscopic picture of this condition having more or less disappeared as result of organization."

The question now arises whether the prolonged convulsions which this child had at the age of six months and from which his blindness dates may not possibly have been induced by the inflammatory changes then taking place within the eyes, associated with the variation in tension.

It is not my intention to launch into a detailed analysis of the above cases but merely to present a few additional points that may be helpful in dealing with problems such as are here involved.

Glioma was the name proposed by Virchow for primary unpigmented neuroepiblastic tumors of the retina on the assumption that they, like the gliomata of the brain, originated in cells of the neuroglia. As a matter of fact they differ greatly from cerebral gliomata for they occur only in early life, neuroglia tissue is not produced and they are more highly malignant[1]. The term neuroepithelioma of the retina is greatly to be preferred.

Glioma is a disease of infancy and childhood, no true case having been found after the 16th year.[2] Most cases develop before the age of three and probably one-half before the age of two. Less than two percent have been observed after the age of ten and oldest known was between 15 and 16[3].

In the literature covering 120 cases at the Royal Ophthalmic Hospital no cases reached the age of 8 years. In Langford and Collins' series of 60 cases between 6 and 7 years is given as the maximum age at the time of excision.[4]

However, Maghy, pathologist at Royal London Ophth. Hospital, describes a case of bilateral glioma in a girl of 20 in whom the second eye was excised after an interval of 18 years[5].

Wintersteiner in his classical work (Das Neuroepithelioma retinae 1897) mentions a case of a patient 17 years of age and duration of the tumor as lasting seven months.

The conditions most often mistaken for neuroepithelioma of the retina according to Wintersteiner are:

1. Simple detachment of the retina. This condition is comparatively rare in early childhood, and there is almost always history of injury.

2. Leucosarcoma of the choroid. This is comparatively rare in childhood.

3. Tubercles of the choroid. Here the history of the case is important altho the diagnosis may be difficult.

4. Chronic inflammatory processes of the choroid and ciliary body. These are the conditions most often causing error. They show retinal detachment and the presence of a fibrinous exudate which later becomes organized.

(N. B. It is here that the third case described should be classified.)

5. Acute suppurative hyalitis. The rapid course of the disease, the presence of hypopyon, scleral perforation, and the discharge of pus may clear the diagnosis.

6. Cysticercus in the vitreous, giving a bluish-white mass in the vitreous and unvascularized, is uncommon in this country.

7. Congenital abnormalities. Persistent vascularity of the lens capsule, and a hyaloid artery with posterior polar cataract may be mistaken for neoplasm.

8. Retinitis circinata, when occurring in children, may be mistaken for this condition[6].

To these should be added the so-called Coats' retinitis exudativa and also dropsical dengeration of the retina, first described by de Schweinitz.

When we consider that the disease is congenital in not less than 10% of the cases and that in 25% it is bilateral[7] we must necessarily be concerned with the question of the incipiency of the condition and its earliest fundus indications. This is a subject much neglected in the literature. It is of course only under narcosis and with dilated pupil that anything approaching a satisfactory examination can be made.

The early signs of glioma retinae are perhaps best summarized by Knapp[8] who says: "In such descriptions as are on record there was found in the retina a sharply defined opaque grayish-white area, which is distinctly prominent and sometimes contracted at the base. The surface may present several flat depressions. Its form is round or oval, its size varies from one-

half to four disc diameters. It arises at the disc or in the region of the macula, or at some distance away. Sometimes there are two distinct tumors. One author observed at the posterior pole a number of small nodes. Vessels continue over the tumor, branch and disappear in its substance, then reappear.

In other cases there are no sharply defined tumors tho a general prominence suggesting detachment of the retina. There are two groups, one with, one without detachment. If no detachment is present a white glistening, nodular or cleft mass is seen, or more anteriorly a pale white reflex or tumor mass. The vitreous contains white flocculent masses of various size which slowly float and represent miliary tumor and nodules; these are very prone to absorb and degenerate. The process apparently can be either in front of or behind the retina. As the growth advances it changes from white to pink. Hemorrhages are not infrequent."

Eyes, however, that have been subjected to the most careful ophthalmoscopic examination and in which no changes could be detected have subsequently developed a gliomatous growth. And the following fact quoted by Collins and Mayou[1] is of much interest. "In the bilateral cases the growths in the two eyes develop independently, one is not metastatic to the other, as shown by patients living for years after the removal of the two affected eyes, without any fresh manifestation of the disease."

The second case described above probably falls into the group of eyes in which there remain persistent elements of fetal structures. The tunica lentis vasculosa and the hyaloid arterial system are both ordinarily absorbed during the latter part of the sixth and the first part of the seventh month of intrauterine life. It is not unusual for one or both of these structures to leave permanent evidences of their existence, varying from minute specks on the lens surface, discoverable in an increasing number of instances since the advent of slitlamp microscopy, to shreds and strands extending from the disc to the posterior lens surface.

Gifford and Latta in their excellent resumé[9] state that "more or less persistence of the tunica vasculosa is not very rare and in cases of most extensive persistence the question of glioma may have to be considered."

Collins in the Moorfield's report for 1893 stated that out of 24 eyes removed at the Royal London Ophthalmic Hospital for glioma the diagnosis was incorrect in seven, four of the seven being persistent tunica vasculosa.

CONCLUSIONS: The problems involved in determining the procedure in the presence of an intraocular growth in a child are many. By no means have all of them been touched upon in this brief sketch. It is often most difficult, but yet of prime importance, to distinguish between glioma and other conditions that may resemble glioma, especially in its early stages, but that are innocuous. But even early enucleation of a gliomatous eye must not lull us into security as the mortality is high after removal. Yet promptness often spells safety.

And finally, as Gifford states, "unless glioma can be excluded with reasonable probability, waiting for further evidence of growth is throwing away the patient's principal chance for life, should the condition prove to be glioma.

Medical Arts Bldg.

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MAKING A NEW LACRIMAL PUNCTUM.

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Epiphora due to misplacement of the lower punctum causes more annoyance than the surgeon often realizes. Operations to remedy this are discussed. The technic found most satisfactory by the author is described in detail.

Cases are not uncommon in whom it may be found, on careful inspection, that the lower lacrimal punctum just fails to be in contact with the globe and lies on the summit of the lid-margin, looking upwards rather than backwards towards the globe. The punctum in such cases is often very small; its displacement from the globe may be very little indeed. The condition is by no means infrequent in children whose only complaint, in respect to eyes which are otherwise normal, may be a tendency to epiphora in cold winds. Patients thus troubled not infrequently come with the tale that they have been treated as having conjunctivitis (tho the eyes are rarely red) and sometimes syringing of the lacrimal passages has been tried at repeated intervals.

Provided the previous passage of instruments in this manner has not torn the lining of the canaliculus and caused incurable stenosis from scar-tissue, these patients can be entirely cured by a simple little operation which usually is so quickly and permanently effectual that the patient is very grateful; I have not seen it in books and the number of patients I have seen during a few years who, needing this treatment, had failed to receive it, makes me feel that it is worth while drawing attention to the condition.

The only operation which I have seen done to meet the condition—apart from the obviously wrong procedure of simply slitting open the canaliculus thruout its length—is to slit it for a considerable distance, then make two vertical cuts in the back wall at each end of the slit portion and lastly to join the lower ends of these vertical cuts by a horizontal one, so removing a more or less square piece which includes an extensive area of the back wall of the opened canaliculus—a procedure which I believe is described as the "three-snip" operation, the aim being that the exposed anterior wall of the canaliculus shall permanently lie in contact with the globe and drain the tears into what remains of a tubular canaliculus. This procedure seems to me crude; it is commonly ineffectual and it does gross damage to a delicate mechanism which cannot be repaired.

Some few years ago I bought a box of old eye instruments and it contained a very delicate instrument which I believe is little used nowadays—a fine straight probe of a diameter to pass thru the canaliculus without dilating it, yet having a fine groove cut along it capable of guiding the point of a knife. I find it is quoted in Weiss' present instrument catalogue as Critchett's grooved probe. It was presumably used in the past for slitting open the canaliculi when this was done so much more often than it is nowadays. I find that the diameter varies and some are rather thick so that they distend the normal canaliculus and force is needed to pass it thru; a very fine one should be chosen which may be passed easily along the canaliculus without distending it, yet the point must be blunt so that there is no risk of perforating or tearing the wall.

When it is desired to make, as described below, a new punctum by enlarging one which is misplaced or is too small, this little instrument, used in conjunction with a fine knife, such as a Graefe cataract knife, is obviously much more suitable than the Stilling ball pointed knife, in which it is impossible to sharpen the blade right up to the "ball" where the cutting edge is really needed.

Instruments required: A small syringe fitted with a fine, yet properly blunt, silver canaliculus nozzle; an ordinary pin which is not too sharp, e.g. a safety-pin; two or three canaliculus dilators—one quite sharp pointed, one medium pointed and one bluntly pointed; the fine grooved probe and a Graefe or similar small knife, or better still a Ziegler cutting needle, straight iris-forceps and Stevens scizzors.

I proceed as follows: Preliminary instillation of 5% cocain drops, fol-

lowed by some solid cocain on the conjunctiva of the inner end of the lower lid. The disused punctum of these cases is commonly too small to admit the preliminary passage of even the sharpest of canaliculus dilators and in this event I first define the opening with the point of the blunt pin. The pin should not be pushed in far: it is best to do no more than just engage the point of the pin and then pull sideways on it so as to stretch the opening a little. After this the manoeuvre can be repeated with the sharpest of the canaliculus dilators and then a blunter dilator may be pushed in to enlarge the opening sufficiently to allow of introducing the fine lacrimal syringe nozzle (I say fine because many of these are made with a crude bulbous end; contrarily some are too sharp and may tear the canaliculus wall). This careful gradual dilatation of the entrance is desirable because if a fine sharp dilator is pushed far into the opening it is very likely to pierce the wall; and if attempts are made with a blunt dilator on an almost invisible opening, the opening soon becomes obscured by temporary surface swelling of the surrounding tissue.

It is well at this stage to syringe fluid thru to test the patency of the canaliculus and lacrimal passage, especially of the former. It is unlikely that there is obstruction save sometimes in those cases where the wall of the canaliculus has been punctured during the ineffectual treatment of repeated syringing. I know of no way to relieve cases so damaged save by removal of the lacrimal gland if the epiphora causes serious inconvenience, and I have recently cured one such afflicted patient of her trouble by removing the lacrimal gland in accordance with the technic followed by Dr. J. M. Wheeler.

A few minims of 5% cocain are now injected with the lacymal syringe along the canaliculus, and some adrenalin is dropped on to the conjunctiva. The grooved probe is delicately inserted without force along the canaliculus, with tension applied in the usual way on the neighboring tissue in the necessary direction to straighten the canaliculus. The probe should slide in perfectly easily until its point is felt to be in contact with the resisting nasal wall whose covering by the sac lining imparts a definite sensation of delicately padded resistance when the probe point is against it. The patient then looks up and, if the operator is unassisted, pulls his own lower lid downwards. The groove of the probe is now turned towards the globe, or even a little downwards towards the bottom of the fornix; it is most important that it should not be turned upwards.

The point of the fine knife or needle with the cutting edge towards the globe, is now placed in the groove and the punctum and canaliculus are cut open towards the globe or fornix for a distance not exceeding about two millimeters. The procedure can always be repeated later if, as is rare, the opening made at the first attempt subsequently proves to be too small. As the edge of the knife is towards the globe the precaution may be taken, if thought necessary, of wrapping a little strapping around all but the tip.

The result of this small cut is to open the beginning of the canaliculus towards the globe by a slit which is thus bounded by an upper and lower lip. A little cocain and adrenalin may with advantage be dropped on now. The lower lip is now taken in the tip of the iris forceps, slightly pulled on and cut off. The result of thus cutting it, when stretched, is automatically to leave, when the tissues have healed, in a day or so, a very small practically equilateral triangular opening, apex downward, whose base above is the upper lip of the knife cut.

This small opening lies in contact with the globe close to the edge of the plica semilunaris when the eye is looking straight forward, or in contact with the plica when the eye is slightly abducted: it most effectually drains away the lacrimal fluid. People so cured are most grateful. I recall in particular one man whose occupation required him to spend most of his time travelling by automobile over long distances in all weathers, and for years he had suffered great inconvenience from epi-

phora of both eyes which he had come to regard as incurable after frequent ineffectual treatment with lotions and syringing thru small puncta which only just failed to be in proper apposition with the globes; the procedure mentioned above, done in ten minutes, cured him permanently.

Sometimes in elderly people so affected, the lids are somewhat thickened. Even so, the new punctum, if properly made, usually lies in contact with the globe: I have rarely found it necessary to resort to some means to bring the new punctum into contact with the globe; in one case I did so by making with the cautery a fine line of surface scar tissue in the epithelium of the fornix below the opening.

It may not be out of place to mention the following way of securing the patient's assistance in small procedures of this sort when an assistant is not procurable: The patient can hold a swab of sterilized cotton wool against his cheek to catch any blood if the swab is gripped in an anaethetist's flat tongue-forceps. The lump of cotton is gripped in the forceps, dipped in boiling water, the hot water then vigorously shaken out of it and the patient given the hot sterile pad in the forceps to hold. That is helpful when performing, unaided, minor operations such as that described above, or opening chalazia.

OCULAR DISORDERS IN ENCEPHALITIS LETHARGICA.

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CHICAGO, ILL.

A case marked by paresis of accommodation, inequality and rigidity of pupils is reported. The records of such cases at Cook County Hospital for the preceding six years were examined and the relative frequency of different ocular symptoms is given in tabular form. Literature bearing on the more frequent symptoms is cited. Entrance thesis read before the Chicago Ophthalmological Society, March 15, 1926.

My interest in lethargic encephalitis was especially aroused by the symptoms and course of the following case:

M. W., aged 51, called at my office December 15, 1924, complaining of blurred near vision, sensation of eyes being crossed and slight dizziness. Duration of symptoms was four or five days, and they had followed what his physician thought was influenza. Examination of the eyes was negative, with the exception that the pupils were markedly contracted and very sluggish in their reaction to light and accommodation. His right vision was 0.8; + .25 ⊃ + .50 × 100 = 0.8 L.V. was 0.8; + .75 = 0.8 + 1.75 added for near brought Snellen chart D.75 down to 13.5 inches. He could, however, read only for about one minute and then the "lines ran together again," as he stated. A +3.00 was finally added to his distance correction, and he could read Snellen D.75 at thirteen inches with comfort, and could bring the chart to within eleven inches from his eyes. The latter apparently was his near point, and his accommodation = 3.7D (100:27.5). Subtracting 3 D. from this amount leaves a balance of 0.70 D. The average accommodation was evidently markedly reduced or partially paralyzed.

I tentatively attributed this paresis to influenza and instructed the patient to return for further study of his case. His condition, however, grew worse, and he was unable to keep his appointment. He developed twitching of the face, slight temperature and insomnia. After several consultations the case was diagnosed as one of lethargic encephelitis.

I saw him once more during the acute stage, and at that time the right pupil was larger than the left, both almost fixed to light and accommodation. One drop of homatropin dilated pupils to 5 mm. The fundus examination was negative.

June 17, 1925, or six months later, the patient called at my office again, asking for near glasses as he was still unable to use his eyes for near work. This time I found in addition a slight divergence of the left eye. Under homatropin he accepted R. + .75 = 0.6 − 3; L. + 1.25 = 1.0 − 3; add + 3.00 for near. Evidently there had been no change in his accommodative power.

To determine what role ocular symp-

toms play in the clinical picture of lethargic encephalitis, I made a study of the records of the Cook County Hospital, (thanks to the courtesy of Dr. Hassin) for the years 1919 to part of 1925 inclusive.

There were about 200 cases diagnosed as lethargic encephalitis, but a considerable number had to be eliminated as the eye findings were vague and questionable; only 157 records in which the eye findings were confirmed by an attending man were studied. Out of these, eighty were acute, seven suspected and seventy postlethargic cases. In the acute series, sixty-four, or 80 percent, showed positive eye findings of one kind or another, and sixteen were negative. Of the postlethargic series, forty-four cases, or 63 percent, had positive eye findings. Most of the patients showed several ocular disturbances.

The following table shows the variety of the disorders and their frequency:

Symptoms	Acute Form	Postlethargic
Mydriasis	12	3
Miosis	4	3
Anisocoria	17	9
Rigidity of pupils to light	34	19
Rigidity of pupils to accom.	23	16
Hippus	1	0
Irregular pupil	4	7
Conjunctivitis	4	0
Paralysis of ext. rectus	16	2
Paralysis of int. rectus	4	0
Paralysis of sup. oblique	1	0
Paralysis of sup. rectus	2	0
Paresis of several muscles	6	5
Failure of convergence	1	1
Diplopia	18	2
Nystagmus	12	2
Blurring of vision	6	2
Bilateral ptosis	16	2
Unilateral ptosis	9	0
Widening of palpebral fissure	2	3
Inability to open eye	1	0
Inability to close lids	2	1
Frequent blinking	1	1
Contracted visual fields	0	3
Lagophthalmus	1	1

As seen from the above table the pupillary changes are the most frequent. Next in order are paralysis of the external recti and ptosis.

These findings, in general, correspond to the observations made by others. A. J. Hall[1] in his splendid book "Epidemic Encephalitis," says: "Ocular disorders of one kind or another have been a constant feature of all outbreaks; they may be the earliest symptoms to be noticed and may first come to the attention of the ophthalmologist."

Parsons[2] in an analysis of 1,273 cases found ocular symptoms in 75 percent. Duverger and Barre[3] found motility disorders in 87 percent of their cases The third nerve is the one most frequently involved and more commonly in ophthalmoplegia externa. Paralysis of accommodation is not uncommon. In the New York epidemic of 1921, it was frequently present without mydriasis. Genet[4] thinks that bilateral paralysis of accommodation with intact light reflex and convergence is a valuable sign. A. L. Whitehead[5] reports four cases of lethargic encephalitis with paralysis of accommodation only. He claims that this symptom occurs most frequently in mild cases, resembling diphtheria in this regard.

Pillizzi[6] describes the following pupillary phenomenon in lethargic encephalitis: While the patient is in stupor and lying on his back the pupils are markedly contracted and react to strong light only: as soon as he is set up the pupils dilate and react promptly to light, altho the patient is fast asleep. On return to prone position, however, the pupils contract and are sluggish again. His explanation of this phenomenon is that the stupor is too deep for complete awakening of the cortical centers, but there is some awakening of the subcortical centers, which temporarily changes the miosis to mydriasis.

Diplopia is generally an early symptom. Yow[7] reports twenty-one cases which began with diplopia. The latter lasted one to four weeks in mild cases, longer in severe ones. In this series he found paralysis of the external recti in 60 percent and paralysis of accommodation in one case. Inability to keep eyes open was a frequent complaint. Nystagmus of various degrees has been observed. Bollack[8] believes there is a close relation between diplopia and nystagmus, the former being chiefly in the direction of maximum nystagmus,

and their frequency being about the same.

Conjunctivitis was frequently seen in the Russian epidemic of 1921, particularly in the initial stages of the disease. Paralysis of conjugate movements, especially upward, is common, according to Hall. Sainton and Cornat[9] observed asynergia between upper lids and frontalis muscle. H. Butler[10] saw three cases of retrobulbar neuritis and one of optic neuritis. Grinker[11] records the case of a young woman in whom there was a gradually increasing optic neuritis, followed by optic atrophy. Hemianopsia have been described. Various groups of symptoms were found in different epidemics. In the French outbreaks of 1919-20, ptosis and paralysis of accommodation were common, while in those of 1921 nystagmus and anisocoria were more prevalent.

As to ocular manifestations in postlethargic cases, while they are not so common as in the acute stage of the disease, yet their percentage is fairly large. They may vary from day to day and from year to year. There may be an interval of even three or four years between the acute and postlethargic or Parkinsonian stage, as it is called, thus resembling syphilis in this regard. Disorders of the oculopalpebral reflex (blinking) are common, either as infrequency of blinking or inabality to open eyes after closure. In some cases there are fluttering movements of the lids on trying to open them. Rossi[12] reports a case of temporary ptosis after closing the eyes several times. One youth would fall from his bicycle on account of inability to open his eyes after closure. The infrequency of blinking is probably due to hypertonicity of orbicularis, or respective antagonistic muscles.

Cords and Blank[13] report residual symptoms six to thirty-six months after lethargic encephalitis, in forty-four out of fifty cases. They found paralysis of accommodation in thirteen cases, paralysis of convergence in thirty-three, paralysis of external ocular muscles in twelve, pupillary disturbances in twelve, nystagmus in eleven and ptosis in four cases.

PATHOLOGY: The macroscopic changes are congestion of superficial vessels, hemorrhage, thickening and opacity of pia and arachnoid. The gray matter is more affected than the white, and the basal ganglia, parts around the aqueduct of Sylvius and the floor of the fourth ventricle seem to be places of predilection. The ventricle may contain an excess of cerebrospinal fluid. The vessels of the choroidal plexus are frequently distended. The cord may be involved in similar changes.

The microscopic changes are most striking in the reaction of the blood vessels. We get the socalled "perivascular cuffs" or an accumulation of round cells (mononuclear or plasma) around the wall. The intima, however, remains intact. Degenerative changes in the nerve cells, such as glial nodes, are also found. As most changes are found in the vicinity of the nuclei of the third, fourth and sixth cranial nerves, practically all the symptoms enumerated above can readily be explained on a pathologic basis.

CONCLUSIONS.

1. Ocular disturbances are very frequent and are found early in lethargic encephalitis.

2. Mild cases are easily overlooked and may first come to the attention of the ophthalmologist.

3. When associated with headache, dizziness, insomnia and increased temperature, ocular symptoms make the diagnosis of lethargic encephalitis almost certain.

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ENDOPHTHALMITIS PHACOGENETICA.

OSCAR B. NUGENT, M.D.

CHICAGO, ILL.

This is a brief summary of the recent literature bearing upon this subject, particularly as to the cause of postoperative intraocular inflammations. It appears that lens protein causes them; and this with other reasons supports the intracapsular as the ideal cataract operation. Read before the Chicago Ophthalmological Society, March, 1926.

My idea in producing this paper is to bring out more clearly the cause of intraocular postoperative inflammation, and to suggest a method of operation which might be selected for the purpose of preventing it, thereby eliminating a condition which in itself does not always prove detrimental to vision, but may lead to other complications with more or less disastrous results. More attention is given to the cause of the disease and prevention than to the treatment.

Endophthalmitis phacogenetica is a name coined by Straub and signifies the intraocular inflammation due to the toxic or chemical effect of lens substance in the eye, more particularly in the anterior chamber following cataract extraction. Endophthalmitis phacoanaphylactica is a term used by Verhoeff and Lemoine indicating the same condition, in which there is supposed to exist a hypersensitive condition in the patient to lens protein.

CAUSE. The cause of this condition has been discussed by various men for many years, and several varieties of causes have been mentioned; some hold that the inflammatory condition is due entirely to infection, others think that it is due to injury to the parts—as traumatism at the time of operation; others are of the opinion that it is due to both conditions. Only in the last two decades—according to data I have been able to obtain—however, has the idea developed, that it may be due to the presence of lens substance being freed into the aqueous or vitreous due to injury or following cataract operation, and further that it depends somewhat on the hypersensitiveness of the individual to lens protein, as will be described later in this paper.

As early as 1899, Schirmer[1] in attempting to discover the cause of this condition proved that the aqueous in the anterior chamber was sterile during these attacks, and therefore was convinced that it was not due to infection as had previously been thought, but he apparently did not suspect lens matter as being the cause.

Uhlenhuth[2] in his experiments in 1903 found by the injection of ox lens protein into rabbits, that the rabbit's blood would not give the preciptin to ox serum, but would react to serum from other animal sources.

Krauss, Doerr and Sohma[3] did considerable work along similar lines in 1908, in which they used the lens protein from various animals for their experiments, with practically the same results.

Lagrange and Lacosta[4] in 1911 were perhaps the first to bring forth the views that the condition was brought about by the presence of lens substance in the eye, and were further convinced that it was not due to infection, a conclusion Schirmer[1] had made some twelve years previous.

More recently Straub[5] came out with his views, after having made an exhaustive study and done a great deal of research work, by which he was convinced that the intraocular inflammation following lens injury was due entirely to the presence of lens matter in the eye and not due to infection, and termed the condition "Endophthalmitis Phacogenetica."

Verhoeff and Lemoine[6] in 1922 conceived the idea that the postoperative inflammatory reaction was possibly due to a hypersensitiveness of the individual to lens protein, which might be acquired or congenital. After an exhaustive program of study and experimentation, they came to the conclusion that there does exist in certain individuals a hypersensitiveness to lens protein which might account for the postoperative inflammation in some patients and its absence in others.

They described cases in their series in which lens matter was left in the

eye at the time of operation as having postoperative inflammation, while in those in which the lens was removed in capsule, no postoperative reaction occurred.

Lemoine and Macdonald[7] in 1924 reported a series of cases. In a group of sixteen cases, most of all operated on by the combined method, in which the amount of lens matter left in the eyes varied from none to a large amount, something like 10 showed a postoperative inflammation, and in those in which no lens matter was left there was no postoperative inflammation.

The visions with correction ranged from 20/15 in cases where there was no postoperative inflammation to light perception in some cases where there was postoperative inflammation. It appears from their tables that in all cases but one where postoperative inflammation occurred the vision was subnormal. This cannot be laid entirely to the postoperative inflammation, inasmuch as the acuity does not depend entirely upon the operation or accidents peculiar to it.

Last year (1925), Sanford B. Gifford,[8] of Omaha, reported numerous cases in which he had carried on the research, and his final conclusion in part is given here in his own words as follows:

"While endophthalmitis phacoanaphylactica in the sense of Verhoeff and Lemoine undoubtedly does occur, a large number of reactions to lens substance cannot be explained as anaphylactic, and perhaps a majority of such reactions are due to the toxicity of lens matter itself. Hence the better name for the whole group of reactions is that of Straub, "Endophthalmitis Phacogenetica."

It is a well known fact that all operators who do the capsulotomy or combined method dread the onset of postoperative inflammation which is present in a certain percentage of cases.

Fisher[9] states in his book on cataract, published in 1917:

"If much lenticular matter is allowed to remain in the eye, it is very likely, even in our greatest effort to keep the pupil dilated, to cause an occlusion of the pupil besides a long course of inflammatory action in the eye, involving the choroid and retina to such an extent as to render futile an operation for artificial pupil with the contemplation of useful vision as a result."

SYMPTOMS.

The onset is from 12 hours to several days following the operation, and the symptoms are essentially those of iridocyclitis, particularly pain, mostly intraorbital and referred to the temple and forehead. According to Verhoeff and Lemoine, "The iris is infiltrated with lymphocytes and plasma cells, the latter greatly predominating, while attached to its surface are large and small lymphocytes and pus cells. Similar cells also are collected on the posterior surface of the cornea where they tend to occur in clumps. The treatment is that described for iritis."

How can this postoperative inflammation be prevented? In reasoning out an answer to the question, we readily come to the conclusion that if no lens matter were left in the eye such inflammation could not occur, therefore some form of intracapsular cataract extraction naturally presents itself as a means of prevention. Just what form or method of operation is to be chosen, is to be decided on by the operator, depending upon his experience and familiarity with the different forms of intracapsular extraction.

It is not intended in this paper to discuss the merits of the intracapsular form of extraction other than the prevention of postoperative intraocular inflammation.

Dr. H. T. Holland[10] said: "Fewer postoperative complications follow the uncomplicated intracapsular operations than that of capsulotomy. One of the twelve methods of intracapsular operation, described in literature, may, in the future, be the operation of choice because of the very few occasions in which postoperative inflammation follow."

I have demonstrated several cases of double intracapsular cataract extraction which I performed by the Smith-Fisher method, to which form of extraction I have been long since converted by my constant association with

Dr. W. A. Fisher, whom I wish to thank for having interested me in it.

I wish further to say in this connection that my operative technic has been greatly improved by practicing these operations on 6 weeks old kittens' eyes, having used to date over six hundred eyes for practice. This operation, however, is not held out as being the operation of choice, but on the contrary, my belief is that another form of extraction is in time to supplant it. I refer to the Barraquer method. I am familiar with all the phases of the Barraquer operation, having used it in a few operations and also observed its use in the hands of other operators, and I am convinced that it is the coming operation.

Conclusions. It seems almost impossible to get an accurate statement of the percentage of postoperative intraocular inflammations, but if you study carefully the literature, you will see that it is quite high in cases of retained cortex and practically nil in cases of intracapsular extraction.

It appears also that there is no question that lens protein is responsible for the postoperative intraocular inflammation, and that certain individuals are more susceptible to the lens protein, its toxic or chemical effect than others.

The general belief of oculists is that the intracapsular operation is the ideal method of extraction for many reasons other than are given here.

It is desired also to give credit to the men who have devoted so much time and untiring efforts in their attempts to determine the real cause of postoperative intraocular inflammation, such as Uhlenhuth, Krauss, Doerr, Sohma, Lagrange, Lacosta, Straub, Verhoeff, Lemoine, Macdonald, Gifford and others, and to the men who have brought forth this intracapsular method of cataract extraction which is given here as one of the methods of prevention—such men as McNamara, Colonel Smith, Wright, Holland, Fisher, Knapp, Vail, Hulen, Barraquer, Greene, Vila Coro, Millette Green, Pratt, Hallett, and others.

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NOTES, CASES, INSTRUMENTS

FAMILIAL CATARACT: A STUDY THRU FIVE GENERATIONS.*

FRANK N. KNAPP, M.A., M.D.

DULUTH, MINNESOTA.

*Read before the Minnesota Academy of Ophthalmology and Oto-laryngology, January 15, 1926, in Minneapolis, Minn.

Perinuclear or lamellar cataracts have been observed by the author in six members of one family, namely, the father, one daughter and two of her children, a son and his daughter. All the cases presented identical ophthalmoscopic pictures. The center of the lens was filled by black radiating streaks, intermingled with fine black spots. By rotation of the eye, these opacities appeared to be both in the anterior and posterior parts of the lens. A red reflex was seen between the opaque streaks and dots. The opacities were as dense in the youngest patient two years old, as in the oldest who was sixty-six years of age. There was a marginal area of clear lens substance. This area was small in the young patients and larger in circumference in the old patients. This adult growth of the lens did not contain opacities. By direct light, these opacities appeared like a white granular mass. Light projection was normal in every direction. The pupils reacted readily to light and accommodation. The tension was normal in all cases. One patient, Mrs. Pauline J., had ocular nystagmus. No other ocular pathology was found.

The great-great grandfather and the great grandmother had cataracts. The grandfather has cataracts. Of his three sisters, all of whom reside in Poland, two had similar eye conditions. Nothing is known of these sisters' families, as the grandfather, a laborer, came to the United States when a young man and has not kept up communication with his sisters. This man had seven children, all born in the United States. Of these seven children, six (four daughters and two sons) had cataracts. One son did not have cataracts.

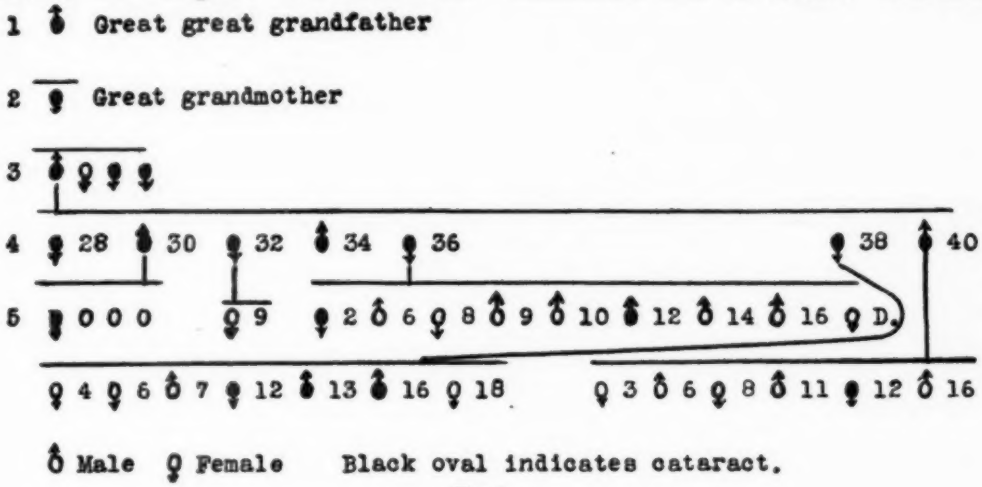
1 Great great grandfather
2 Great grandmother
3
4 28 30 32 34 36 38 40
5 0 0 0 9 2 6 8 9 10 12 14 16 D.
4 6 7 12 13 16 18
3 6 8 11 12 16
Male Female Black oval indicates cataract.

Fig. 1.

The youngest daughter had cataracts; she had no children. The youngest son in the family is the father of four children. Of his children, one girl suffered from cataracts. The second oldest daughter had cataracts. Her only daughter had normal vision. The second oldest son had no children; he had normal vision.

Mrs. Pauline J., the next oldest of the family, had nine children. The first child died shortly after birth. Of the remaining children, one girl two years of age, and one boy twelve years old, had cataracts. The other six children did not have cataracts. The oldest sister suffered from lens opacities. She had seven children. Of the three born of her first marriage, two had cataracts. Of the

four children born of her second marriage, one had cataracts.

Mr. Stanley G., the oldest son, had cataracts in both eyes. He had three boys and three girls. One girl had cataracts in both eyes.

Mrs. Pauline J., age 36, had bilateral cataracts with ocular nystagmus. Her vision was O.D. 10/100, O.S. 10/100. A combined expression was done on the right eye in November 1925, from which she made an uneventful recovery. Two months later a discission of the capsule resulted in a clear pupil. The manifest refraction was:

O.D. + 8.00 Sph. ⊃ 1.00 Cyl. ax. 90° = 20/65.

O.S. not improved with glass.

Mr. Stanley G., age 40, had double cataract. Vision was O.D. 20/100, O.S. 20/100. This patient had not received operative treatment. He holds a position with a local wholesale hardware company.

Leonard J., aged 10, son of Mrs. Pauline J., had vision O.D. 20/100, O.S. 15/100. His right eye had been operated on four times. A discission of the left lens was done in November and December 1924. No inflammation of the eyes followed. Absorption of the lens was very slow. On January 11, 1925, a corneal incision was made, and considerable lens material was expressed. The final manifest refraction was as follows:

O.D. + 9.00 Sph. ⊃ + 2.00 Cyl. ax. 110° = 20/40.

O.S. + 9.00 Sph. ⊃ + 2.00 Cyl. ax. 100° = 20/40.

+ 3.00 Sph. added = 1 mm. type.

Beatrice J., age 2, sister of Leonard J., had complete absorption of the lens after four discissions of the left eye. The visual acuity is not recorded because of the patient's age.

Florence G., age 12, daughter of Stanley G., had double cataracts. Her vision was O.D. 20/100, O.S. 20/100. She had a discission of the left lens. A month later a button hole iridectomy was performed with expression of the lens. The recovery was uneventful. Manifest refraction was:

O.D.—no glass.

O.S. + 8.00 Sph. ⊃ 0.50 Cyl. ax. 180° = 20/40.

+ 3.50 Sph. added = 1 mm. type.

Conclusions: A history of double cataract extended thru five generations of this family. Three of the four members of the third generation suffered with partial cataracts. Six of the seven members of the fourth generation were born with partial cataracts; while in the fifth generation only eight had cataracts from a total of twenty-five. These patients were of normal mentality with no history of consanguinity. The adult growth of the crystalline lens was manifested by the increased area of clear cortical substance in the older patients. The density of the opacities did not increase with age. Removal of the lens had resulted in increased visual acuity in all cases. Optical iridectomy was not warranted as vision was not improved by dilatation of the pupil.

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PARALYSIS OF DIVERGENCE WITH CHOREA AND WITH TABES.

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CHICAGO.

Ocular troubles in chorea are rare. Occasionally the pupillary reactions to light and accommodation are sluggish. Sometimes there is a tendency to dilatation of the pupil, which may preponderate on the side most affected. Also, transitory diplopia may occur, due to twitching or spasm of one or other ocular muscle[1].

However, there is yet to be reported an instance of muscular imbalance due to *central lesion*. The following case of chorea with *paralysis of divergence* is hence apparently unique:

The patient, a boy of ten, was seen Nov. 15, 1924. The child was delicate, with general adenopathy; highly nervous, (the finger nails were bitten off); and manifested typical choreiform movements of limbs. At the age of six, tonsils and adenoids were removed.

For the preceding few days he had been troubled with *diplopia for distance* tho not for near. This is the dominant complaint of the patient who had as yet not consulted any other physician.

The character of the muscular im-

balance was conveniently tested with a red glass before one eye and a blue glass before the other. The diplopia was homonymous (esophoria) both for near and for distance. The correction for distance was 16 prism diopters base out, and for near 6 prism diopters base out. The diplopia was uniform in all directions of gaze, and only varied with a change in distance of the test light.

The vision was R. 20/25; L. 20/25; the refraction: R. + .87 S.; L. + .75 S. The child was given the correction for the right eye, and a frosted lens for the left.

The pediatrician to whom the child was referred confirmed the diagnosis of chorea, and hospitalized the patient. The blood Wassermann was negative, and the basal metabolism rate practically normal.

With the glasses the child was comfortable, and would put them on the first thing in the morning. Without the glasses, for the first two weeks of his illness, diplopia for distance was constant; in the succeeding two weeks he could see sporadically single; and in the fifth week, diplopia occurred only occasionally.

On Dec. 18 (five weeks after the first examination), the ocular muscle balance was retested. With colored glasses there was fusion in the distance test, but with the Maddox rod 2 prism diopters of esophoria could be demonstrated. For near vision there was now orthophoria. The frosted lens over the left eye was discontinued, and replaced by his correction.

On Jan. 5 (two and one-half weeks later) examination disclosed orthophoria for distance and 5 prism diopters exophoria for near. Repeated observations since have shown no further change in the muscular balance. The progress of the case, as noted by the phoria tests, may be thus tabulated:

DATE	DISTANCE	NEAR
Nov. 15, 1924.	16Δ esophoria	6Δ esophoria
Dec. 18, 1924.	2Δ esophoria.	orthophoria.
Jan. 5, 1925.	orthophoria.	5Δ exophoria
Feb. 2,1926.	orthophoria.	5Δ exophoria
Sept. 5, 1926.	orthophoria.	5Δ exophoria
Feb. 20, 1926.	orthophoria.	5Δ exophoria

In March 1925, the child was rehospitalized for an exacerbation of the chorea and troublesome insomnia, but remained free from eye symptoms.

Dunnington[2] in a recent comprehensive study mentions that the condition of paralysis of divergence was first described by Parinaud in 1883. Duane[3] in 1897 proved the trouble to be innervational, and placed the probable location of the divergence center in the immediate vicinity of the sixth nuclei. To date cases have been reported in syphilis, tabes, multiple sclerosis, lead poisoning, cerebral tumor, diphtheria, poliomyelitis, and epidemic encephalitis. The prognosis for acute conditions, as chorea and diphtheria, is good; but in the chronic disorders is uncertain.

In this connection it is relevant to mention that in tabes under active antiluetic treatment, I have observed that a tendency to recovery may occur, and the patient be much benefited with low degree prisms base out for distance. This point, which does not appear to be generally recognized, is illustrated in the following case (divergence paralysis in tabes complicated with optic atrophy):

A male, age 26, complained of diplopia for distance for the preceding four months, which developed at the same time that he was beginning to stagger in the dark, and to have trouble with his gait. Since the development of this disorder, he has been unable to enjoy a cinema except with one eye closed.

The central vision was R. 20/15; L. 20/15; the refraction: R. + 1.00 S. L. + 1.00 S. The form field of each eye was contracted to 30 degrees, and the colors (green, red, and blue) were only recognized within the 10 degree circle.

Tested with colored lenses, the test light was seen double until approached to 2 ft. distance. At 20 ft. fusion occurred with 11 prism diopters base out. The diplopia was only affected by distance, and not by the direction of gaze. Without the colored lenses and simply wearing his correction, the double

lights at distance were fused with 2 prism diopters base out. He was given this in his prescription, and distant vision was thereafter rendered comfortable.

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OPHTHALMIC SPOT LIGHT.

J. G. Parsons, M.D.

LEWISTOWN, MONTANA.

A portable, inexpensive spot light for operative work is a great convenience. I constructed the following described apparatus in a few minutes' time and have found it very efficient. A three celled Eveready Focusing Flash Light was fitted with a metal collar to which was soldered a flat tube which could be slipped onto a supporting rod.

The supporting rod was bent at a suitable angle and attached to a folding music rack stand.

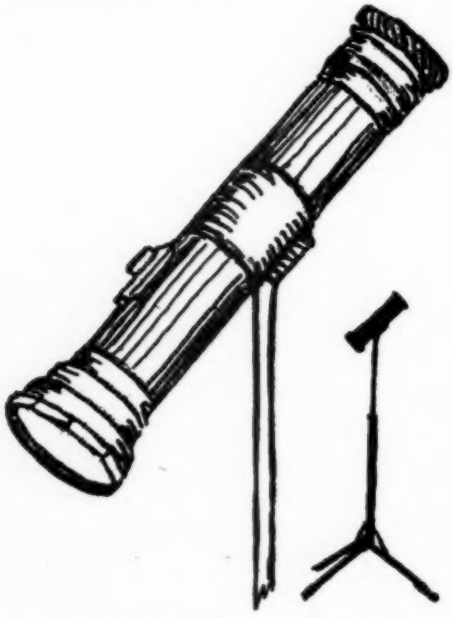

Fig. 1. Parson's spot light for operative work, shown first in detail, and then in connection with supporting stand.

The flash light is capable of adjustment and throws a brilliant spot of light about an inch in diameter at twenty inches.

An emergency apparatus may be readily improvised by fastening one of these flash lights to any available support by means of adhesive tape.

THE UVIOL LIGHT.

S. R. Gifford, M.D.

OMAHA.

This apparatus is designed for the administration of ultraviolet rays in concentrated doses, in such a way that they may be focused sharply on small lesions in the eye, especially on corneal ulcers. The source of light is a micro-arc lamp such as is supplied by the Zeiss Company for examination of the fundus with red free light. It is mounted on an adjustable stand. It is supplied with a rheostat for use with the ordinary alternating current. In front of the tube is the uviol filter, ("a" in the illustration). The "uviol" glass of which it is made allows light of short wave length (ultraviolet) which is absorbed by the cornea, to pass; the visible rays, except a narrow band in the blue violet. It is supplied with the special irradiation arc light of Zeiss, which Birch-Hirschfeld has used, which is harmless to the deeper structures, being retained. A quartz cell containing iron sulphate solution may be placed before the filter to absorb the heat waves. Without this cell, however, I have not found the heat inconvenient to patients, if the lids are closed for a second several times during the treatment. I have seen no ill effects from it, and it may possibly aid the effect of the light. Mounted on an arm in front of the filter is a quartz lens of 2.8 inches focal distance (b). By its means the ultraviolet rays passing thru the filter may be focused to a small point on the cornea. A quartz lens is necessary since these rays would be absorbed by ordinary glass. The apparatus may be used for examination of the fundus by red free light, by simply changing the uviol filter for a red free filter and removing the quartz lens.

Scheerer, Birch-Hirschfeld and others have reported very favorable results in various types of corneal ulcer, especially serpent ulcer, in tubercular keratitis, tubercular iritis and other diseases. They recommend the instillation of fluorescein previous to the treatment. The light is supposed to act directly on the organisms and indirectly by means of the tissue reaction aroused. This action is thought to be increased by a chemical photosensitization of the tissues effected by the fluorescein.

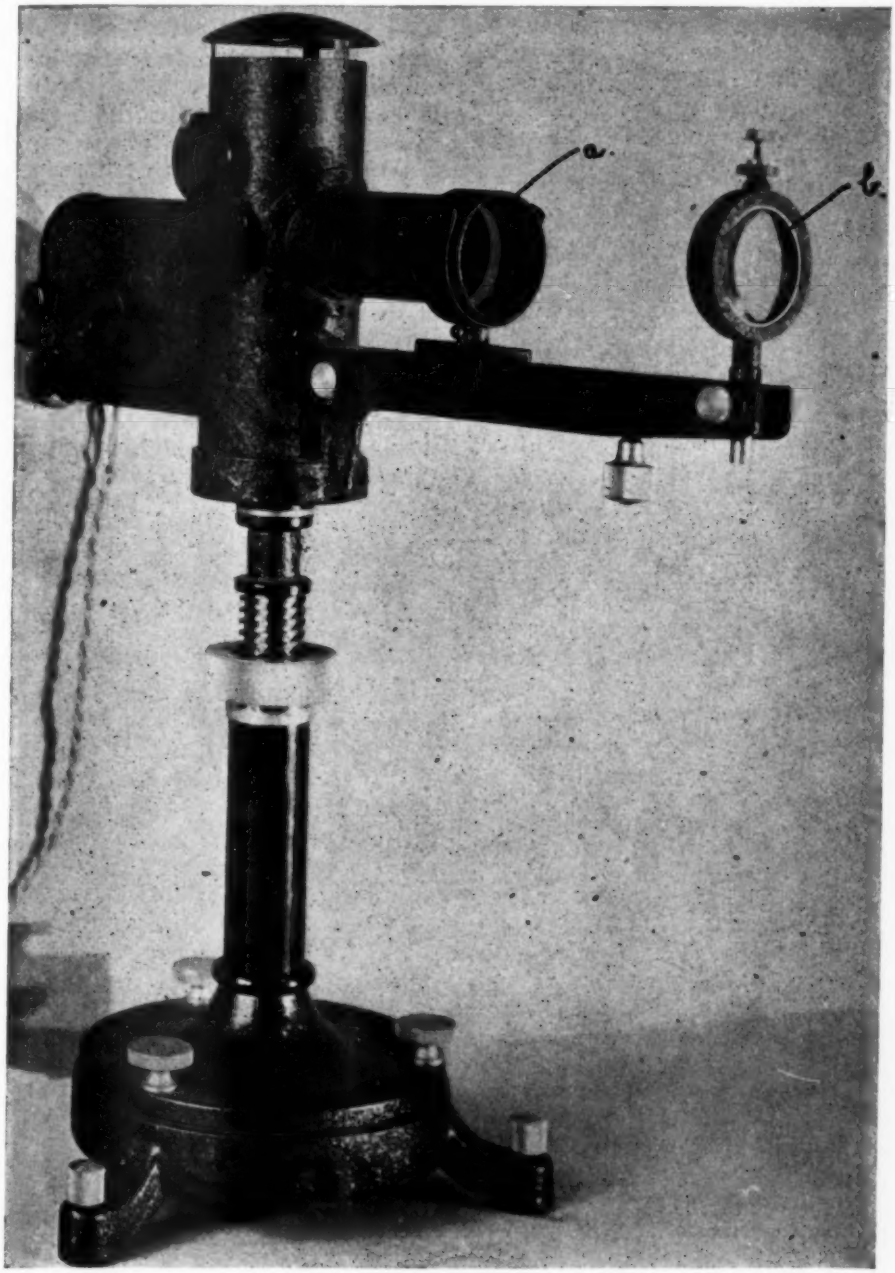

Fig. 1. Apparatus for uviol light, Zeiss Microarc lamp. a, Cell for uviol filter; b, Quartz lens for condensing ultraviolet rays.

I have not depended on the light in cases of serpent ulcer where other more familiar measures seemed necessary. Birch-Hirschfeld, however, and Gilbert, with an experience in hundreds of cases, see in the light the most effective means of attack in serpent ulcer. The type of corneal ulcers which I have seen respond most favorably have been shallow recurrent ulcerations which have been very refractory in their disposition to heal under the ordinary methods of treatment. A number of these have probably been of herpetic nature. Here the action of the light combined with the ordinary methods of treatment has seemed definitely to hasten recovery.

A marked effect is also noted upon the pain from such lesions, usually after the first application. Another condition which has apparently been affected favorably is sclerosing keratitis and other keratitides supposedly due to tuberculosis. The effect of the light combined with the use of tuberculin has seemed of very decided value in several of these cases. Applications are made every day or even twice a day for eight to twelve days, depending on the progress of the case. The light is focused as sharply as possible on the lesion for three to five minutes. One or two adjustments of the arc lamp is usually sufficient to last this length of time. The automatic clock work adjustment of the arc has proven to be nothing but a disadvantage in my experience.

Besides its therapeutic use, the uviol light seems to present certain advantages from a diagnostic standpoint, which I have not seen mentioned. Under its illumination the tissues of the eye and especially the lens are seen to be fluorescent. Very small lesions of the cornea, imperceptible by ordinary methods of illumination share in this fluorescence and are made easily visible. Such lesions as dendritic ulcers may be followed to their very fine ramifications under this light and some small infiltrations or erosions may be seen by it which otherwise might be missed entirely. Since writing the above I have seen these advantages referred to by several authors. Thiel (Zeitschrift für Augenheilkunde, 1925: 58, p. 86) describes lens changes as seen by uviol light. Bane uses red free light for examining the cornea, and Friedenwald yellow light.

Brandeis Building.

SOCIETY PROCEEDINGS

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section on Ophthalmology.

March 18, 1926.

DR. EDWARD A. SHUMWAY, Chairman.

Drusen of the Fundus.

DR. HUNTER W. SCARLETT showed a boy, 9 years old, who presented in the right eye, a translucent, glistening, cone shaped mass, down and out, a short distance from the nervehead, extending into the vitreous about three diopters.

The usual location of these lesions, according to Fuchs, is in the periphery, but they may be found in the papillomacular region.

These excrescences are supposed to arise from the lamina vitreae and are seen mostly in the old, altho they may occur in the middle-aged and even in the young.

Xeroderma Pigmentosa.

DR. BURTON CHANCE exhibited a case of xeroderma pigmentosa in a young man of 17. The disease, which appeared at two years of age, has spread over the upper half of the body, the hands and forearms, into the scalp and has seriously involved the eyelids and globes. The lids showed cicatricial changes and ectropion, that of the left eye being marked; the conjunctivae were atrophic and so shrunken as to contract the fissures. The scleras were freckled, quite early, and the corneae became ulcerated, the right being hazy, with leucomata marked in the left. The eyes are sensitive to light and so tender to the touch that it is with difficulty that the globes can be inspected. The ectropion of the left has been greatly reduced by recent electrocautery puncturing of the conjunctival surface. This is the second case so afflicted in the family; the elder having died from the extension of the disease. The parents are Jewish, full cousins; but in no member of the family on either side has there been any history of the disease.

Dr. S. Lewis Ziegler.

DR. PAUL J. SARTAIN read the following memoir. Dr. S. Lewis Ziegler, a fellow of this Section since 1899, and Chairman of the Section in 1915 and 1916, succumbed to an attack of pneumonia on the 4th of January, 1926.

Dr. Ziegler was born in Lewisburg, Pa., on the 5th of February, 1861; received his preliminary schooling there and then entered Bucknell University from which he was graduated with the degree of A. B. in 1880.

He came to Philadelphia in 1882 and matriculated in the Medical School of the University of Pennsylvania, and was graduated in 1885, then serving as interne at the Germantown and Episcopal Hospitals, and finally at the Wills Eye Hospital, in which he later became attending surgeon and subsequently executive medical officer.

In 1889, he organized the eye clinic at St. Joseph's Hospital and remained a member of the staff up to the time of his death.

In recognition of his work, he subsequently received his M.A. from Bucknell, and had the honorary degrees of Sc.D. and LL.D. conferred on him by Bucknell and Lafayette respectively.

A close observer, of keen and analytic mind, he studied his cases with an untiring exactitude which generally brought him to conclusions logically correct and sometimes at variance with the usually accepted theories of etiology and pathology.

His treatment, always rational and often original for difficult and obscure cases, has, in many instances, become accepted as most efficacious.

His ingenuity in devising and supervising the making of new instruments in ophthalmic practice, was of absorbing interest and genuine pleasure to him, and some of his special operations have received well merited international recognition and adoption.

As an operator, skillful, decisive, quick, meeting the emergency as it arose, often anticipating a complication, his results averaged high, and in many cases referred to him after un-

successful operations, his V-shaped iridotomy, which he so dextrously performed, gave brilliant results.

Dr. Ziegler took the keenest interest in the new developments in the general field of medicine, and his activities outside his own specialty were evidenced by his valuable work in the local chapter of the American Red Cross, and his successful administration as Director of the Bureau of Health and Charities of the City of Philadelphia.

For some years Dr. Ziegler had been writing and collecting material for a monumental work upon the surgery of the eye. He spent much time in the great libraries of Europe consulting original authorities and having photographic copies made of the portraits of the most noted ophthalmic surgeons from the earliest times. These portraits, together with reproductions of an admirable set of drawings of operations made under his directions, would have been the illustrations for the text, still unfinished, which it was the ambition of his life to complete.

His appreciation of art, and love of the beautiful led him into the field of collecting, during his visits to Europe, and made a pleasant diversion from his work—relaxation he had never learned.

The interests of his College he had always at heart, and was ever ready to serve it to the best of his ability. His genial personality, sterling honesty in his work and unswerving loyalty to his friends remain with us as a cherished memory.

Angioid Streaks of the Retina.

Dr. J. Milton Griscom exhibited a case of angioid streaks of the retina corresponding in most details with the cases already reported. Discussion of the condition and an exact description of the fundus picture was postponed until a later date.

Discussion. Dr. Zentmayer showed the plate of a case exhibited before the Section several years previously. He said he had expressed the opinion that the lines were pigmented, congenital vessels. The theory which seems best to explain this characteristic type of pigment streaks is the one advanced by Collins, that they are the postciliary vessels rendered visible by the entrance into their perivascular lymph spaces of hemosiderin. There are other types of pigment lines in the retina, and in one of these both Alt and Fuchs have found them to be due to folds in the pigment epithelium.

Dr. G. E. deSchweinitz exhibited some water colors illustrating angioid streaks in the retina, the case histories having been reported a good many years ago. The lesions exactly corresponded with those observed in all other cases of this affection, and were especially interesting in that they occurred in two members of one family—brothers, indicating, in this instance, a familial tendency. Dr. deSchweinitz had originally adopted the explanation advanced by Lister that the streaks represented newly formed vessels which had penetrated inflamed tissues, along which pigment deposits are arranged. But since Coates' suggestion that the streaks arise along vessels which belong to the choroid rather than the retina, and Treacher Collins' observations that they are due to "hematogenous pigment from subchoroidal hemorrhages deposited in the perivascular spaces around the short ciliary arteries, especially in the neighborhood of the disc and circle of Zinn," he believed that a more satisfactory explanation of the production of this condition had been advanced.

Dr. Burton Chance asked whether the patient was a negro. He could not recall having seen a case showing such streaks in a colored person, but had found them in those of fair complexion. Might not this case be one of excessive pigmentation without inflammatory or degenerative changes in the retina?

Dr. Edward Shumway said that, so far as he knew, angioid streaks in the retina had not been reported in colored patients, and a new factor of pigmentation might be introduced in the present instance which might represent a deposit of pigment along a deeper set of vessels without a previous hemorrhage into the retina.

Disciform Keratitis.

DR. WM. ZENTMAYER exhibited a classical case of disciform keratitis in a young man, a student. The lesion was slightly eccentric and had a diameter of 8 mm. There was a characteristic, dense margin. The central area was less dense and showed dot and line opacities. The ciliary congestion was moderate.

The condition had existed for seven weeks and began with the sensation of a foreign body. There was no history of injury. The tonsils were infected.

Discussion. DR. G. E. DESCHWEINITZ expressed his satisfaction that Dr. Zentmayer had brought for observation his patient who typically exhibited a real keratitis disciformis, that is, a ring like or disc like keratitis, which corresponded in all respects with Fuchs' original description.

He deprecated the casual use of the term "disciform keratitis," as it so frequently occurs in literature, in many instances the lesion being simply disc like in appearance, but in no way conforming to the type of keratitis as recorded by Fuchs. He was aware that certain authors, for example, Verhoeff, were unwilling, from the etiologic standpoint, to admit that this corneal affection should be regarded as a clinical entity. But, nevertheless, he believed that "disciform keratitis" should be used to express a definite conception, that is, to describe an individual type of keratitis.

Nodular Degeneration of the Cornea.

DR. WILLIAM ZENTMAYER showed two cases, sisters, who were referred to the Wills Hospital by Dr. D. Fordyce in 1922.

E. R., 19 years of age. Poor vision in the left eye since eight years of age. Vision: R. E. 6/30; L. E. 1/60. In both corneae there were subepithelial, grayish, tortuous, thick lines. The overlying epithelium was shagreened. The corneae were somewhat conical. No detailed view of the fundus was obtainable.

March 16, 1926, vision was R. E. 2/60; L. E. 1/60.

D. R., 28 years of age. History of mild inflammation in both eyes when five years of age.

R. E. grayish, breadcrumb opacities, very dense over the central three-fourths of the cornea. Periphery nebulous.

L. E. typical nodular opacities in Bowman's membrane. Surface of the cornea shagreened.

March 16, 1926. The opacities in the right eye have coalesced and the central three-fourths of the cornea has a dense, almost uniform gray appearance, tho there are still some subepithelial nodes lifting up the epithelium. The perforating vessels are greatly enlarged and tortuous. Vision in each eye reduced to hand movements.

In 1922, this case was treated by application of the thermophore at a temperature of 140°. This caused some exfoliation of the epithelium with a slight improvement in the vision. This was but temporary. Both cases received thyroid extract. Physical examination was refused by the patients.

Mention was made of a family in which nodular degeneration of the cornea was present in 9 members of the family, 36 having been examined. Two other members, not examined, were said to have been similarly affected.

No distinctive changes were noted in the corneal nerves with the slit lamp.

Discussion. DR. DESCHWEINITZ, referring to the treatment of such cases as Dr. Zentmayer had reported, described his efforts to relieve a typical case of this character. Remembering Wehrli's contention that the disease represented a form of chronic tuberculous disease of the anterior layers of the cornea, he had tried prolonged tuberculin treatment, associated with persistent massage of the cornea, with the aid of dionin and yellow oxid salve, but without the slightest benefit. Thus far, it would seem, no therapeutic measure had been devised which yielded any satisfactory results.

DR. BURTON CHANCE said these eyes recalled to his recollection those of a man and his son whose history he had reported several years ago at a meeting

of the ophthalmologic society. His experiences had been quite like those of Dr. deSchweinitz. All sorts of examinations were made, and every kind of remedy proposed was employed, yet inquiries into the causation of the affection, and attempts at the lessening of it were without avail.

Microphthalmus with Orbital Cyst.

DR. E. A. SHUMWAY and DR. A. R. RENNINGER reported a case, P. A., aged 15 months, female, who was brought to the Children's Hospital Dispensary on March 27, 1925, and was seen by Dr. Renninger. The child was born Dec. 5, 1924, and weighed 6 lbs., 3 oz. at birth. It was a well developed infant, and has been in good health since then except for a recent attack of bronchopneumonia, for which it was treated at St. Agnes' Hospital. Here it came under the observation of Dr. Geo. F. Kelly, who has been good enough to send us some details of the family history. The condition of the left eye was present at birth, and the mother thinks the cyst has increased in size. The father of the child is living, but has some heart affection and a chronic cough. The mother had chorea at the age of 12, but is now comparatively well. There were five children; the oldest is 8 years of age, is deaf and is in a home for the deaf; the second, 6 years old is very nervous. The third was still-born at about 6½ months; the fourth now 4 years old, has a bad heart, and the present child is the fifth.

She has been examined also at the Wills Hospital, Methodist Hospital, and by a number of other physicians. She was brought to the Children's Hospital from March to September, 1925, and during this time Dr. Renninger could detect very slight difference in the size of the cyst.

Present condition. The anterior part of the orbit is occupied by a large, thin walled cyst, which bulges forward between the eyelids, and seems to be divided by septa in its interior. It transmits light, and is freely movable. On its lower surface, well back in the orbit, and so hidden by the cyst that it at first escapes notice, is a rudimentary or microphthalmic eye, which is connected with the cyst and moves with it. The cornea is turned forward, is about 4 mm. in diameter, and the iris shows a coloboma below, apparently at the opposite side from the connection with cyst. No other congenital abnormality is present. The fellow eye is normal, and shows no evidence of coloboma. Roentgen ray examination of the cyst and orbit at St. Agnes' Hospital was negative.

Cyst of the orbit in association with microphthalmus is a comparatively rare condition. According to Parsons, it was first accurately described by Arlt in 1858, as the result of two anatomic examinations by Wallman. According to von Hippel, Jr., in Jena, who wrote the section on congenital anomalies in the second edition of Graefe-Saemisch, and in Schwalbe's System on Morphology and Malformations of Man and Animal, 62 cases had been reported up to 1908, 26 with anatomic examination of the eyeball, in connection with the cyst. These examinations have proved positively that the cysts stand in direct relation to the development of the eyeball, with which they are in direct connection, and the constituent parts of which are found also in the cyst. Every graduation may be met with, from the ectatic coloboma of the choroid to the fully developed cyst. There are two chief hypotheses as to the origin of these cysts, associated respectively with the names of Arlt and Kundrat. Arlt's hypothesis is that the cyst is due to extreme development of ectasia in the neighborhood of a defectively closed cleft, in the secondary optic vesicle. Kundrat's hypothesis is that the cyst is formed from the noninvaginated primary optic vesicle; he assumes that the secondary optic vesicle does not develop, but that the distal part of the primary optic vesicle grows into the surrounding mesoderm and develops into a cyst. This hypothesis may account for the cases in which complete anophthalmus is found, but where there is microphthalmus, which is the usual condition, Arlt's idea is the generally accepted one.

The ocular cleft, thru which the blood vessels pass into the interior of the secondary optic vesicle, closes early in fetal life, cutting off the mesoblastic structures external to the secondary optic vesicle from those internal to it. Occasionally a union persists between these mesoblastic tissues inside and outside the retina, or there may be a delay in the separation so that there is a defective closure of the gap in the wall of the vesicle, and a coloboma results. Eyes with this form of coloboma usually do not expand to the full extent and are microphthalmic. Moreover, the region in which a coloboma occurs is frequently a weak spot in the walls of the globe, and is very likely to become ectatic, sometimes to such an extent as to produce these large cystic protrusions.

Microscopically, the cysts have a fibrous tissue wall, derived from the sclerotic but this, as in our case, may be absent. The choroid is absent over the cyst wall, or extends only a short distance into it. The cysts communicate with the interior of the globe by an opening, which is usually small, but varies in size. They are lined by representatives of one or both layers of the secondary optic vesicle, the outer one of which develops normally into the pigment epithelium of the retina, while the inner represents the retina proper. In the cyst the pigment epithelium is much altered, forming a somewhat laminated layer of cellular tissue. The retina proper is folded near the orifice, but also lines the cyst, and it may be well developed so that the layers are distinguishable. In some cases it lies as in the eye, while in others it has a socalled inverted position, i. e., the rods and cones are turned toward the lumen of the cyst. As a rule, these cysts are connected with the under surface of the eyeball, but occasionally they are found above, and appear beneath the upper lid. For these cases, Ginsberg has advanced the hypothesis that the cysts are due to nipping off a knuckle of the secondary optic vesicle by mesoblast so that it becomes incarcerated, tho still in connection with the eye, and under the intraocular pressure it expands. This hypothesis would explain cysts in any position.

Motais Operation for Ptosis.

Dr. Charles R. Heed exhibited a young woman, aged 18 years, who had congenital ptosis of the left eye and upon whom he had recently performed a Motais operation, with the modification suggested by Dr. Wm. T. Shoemaker. In the latter part of the operation as described by Motais, the tongue of the superior rectus tendon is drawn into a pocket between the anterior surface of the tarsus and the skin by passing the two needles into this blind opening and bringing them out thru the skin, two millimeters from the lid margin, about four millimeters apart, and tying over a roll of gauze. There is some uncertainty as to the position of the tongue, and not infrequently the suture cuts thru the tendon before adhesions have taken place. Dr. Heed recorded three failures due to slipping of the tongue from imperfect attachment.

In Dr. Shoemaker's method, a small incision is made thru the skin of the lid midway between the superior tarsal border and the lid margin. The tarsus is exposed to view, and a small incision passes thru the conjunctiva just above the superior margin. The two needles with the suture and tendon are brought thru this opening. A firm attachment is then made by passing the needles into the tarsus near its superior margin. The needles are then brought out thru the skin near the lid margin and tied over a roll of gauze. Two sutures close the skin incision. The modification enables one to view clearly the position of the tongue as he firmly attaches it to the tarsus, and does not complicate the operation.

Dr. J. H. Dewey exhibited a case of Motais operation for ptosis which showed some overcorrection of the ptosis which is rather in contradiction to the generally accepted opinion that there is no danger of obtaining such a result. The overcorrection is no doubt due to bringing the suture too near the ciliary margin of the lid. He

uses the open operation and after tying the suture thru the skin below the line of incision, with tongue of the muscle fully exposed to view, he attaches the muscle with a second suture thru the skin above the line of incision. He believes that this greatly reduces the chance of failure.

Discussion. Dr. Zentmayer said he regretted not having brought a recent Motais operation to show, as there would have then been an ideal result, an overcorrection, and a failure.

He had done the open operation and had followed O'Connor's suggestion of shaving off a layer of the sclerotic with the tendon tongue. Despite this, the suture tore out, due to the operator making entirely too much traction on the sutures after bringing them out at the border of the lid. Forty-eight hours later, under ether, the tongue was found and stitched firmly to the surface of the tarsus, and the result now bids fair to be a success.

Dr. William T. Shoemaker called attention to two modifications of the original operation which he published in 1907. (Annals of Ophthalmology October, 1907). The first was the open method which Dr. Heed practiced in his case, and which he found easier of execution, more accurate and more satisfactory.

The second modification which was suggested but which, so far as Dr. Shoemaker knows, has not been tried, is based on his conviction that in the final analysis, any Motais operation can do nothing more than physically attach the base of the eyelid to the eyeball at, or near, the insertion of the superior rectus muscle. If this is true, it is quite unnecessary to laboriously prepare a tongue of rectus muscle to carry into the lid tissues. The same thing can be accomplished by exposing the rectus muscle, and the upper margin of the tarsus, and, without cutting or interfering with the tendon, pass a double-armed suture beneath the middle half, third, or any other portion of it, and then thru the tarsal margin, and on to the skin surface of the lid and tie. This would bring the base of the lid in firm contact with the eyeball at the desired point and the two wounds would unite. This is the very valuable Motais principle, and it is difficult to see how the original technic can do more, with the tissues in question. The piece of prepared rectus tendon is inextensible and cannot be carried independently into the lid, but the lid must be carried to it, and there unite at the original site of the tendon.

Dr. Leighton F. Appleman,
Clerk.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

March 15, 1926.

Edwin J. Gardiner, M. D., presiding.

Pulsating Tumor of Orbit.

Dr. E. M. Hartlett (For Dr. E. V. L. Brown) presented an Italian, 59 years of age, who had had trouble with his right eye for thirty-nine years. At 20 years he was in the Italian army in Algiers. His eye became infected following wiping with a soiled handkerchief which he had found. After hospitalization for six months, he was discharged with a blind eye. At the end of five years, the bulb had so atrophied that he was able to put a glass eye in the socket over the eye. He wore this prothesis almost continually until two days before Christmas, 1925, without signs of irritation. At that time he had a slight cold and the tissues of the right orbit became red and swollen and discharged pus freely.

Two months later, when he came to the clinic, the lids were red and swollen, the fissure obliterated and the tissues under the upper lid indurated. When the lids were separated thick, whitish-yellow pus discharged freely. He was admitted to the ward with a diagnosis of orbital cellulitis. After ten days treatment with hot applications the acute symptoms subsided. A mass was noted at this time under the right brow, somewhat receded from the edge under the orbital ridge, about the width of a finger. Roentgen rays were taken of the orbit, which were negative; sinuses were negative, blood Wassermann negative. Temperature varied

from 97° to 100° F. Other findings were practically negative except for a slight trace of albumin in the urine.

He returned six weeks later at which time the mass in the orbit had increased to almost twice its former size. There was distinct pulsation synchrous with the radial pulse. The additional history of morning nausea and vomiting since December, 1925, was now elicited and he was admitted to the hospital for gastrointestinal study, which proved negative. Further Roentgen rays were taken of the orbit and of the sinuses, revealing a sinusitis of the antrum on the left side, ethmoids and frontal, with erosion and necrosis of the orbital ridge on that side. The nose was full of polyps, and the antrum was filled with greenish brown stringy pus. Further laboratory study showed blood sugar 120, nonprotein nitrogen high 69; Mosenthal test high fixation 1022/24. From the Roentgen ray pictures presented it was noted how rapidly the mass grew and destroyed the orbital wall—the Roentgen rays having been taken thirteen days apart.

Endophthalmitis Phacogenetica.

Dr. Oscar B. Nugent read a paper on this subject. See p. 680.

Discussion. Dr. Harry Woodruff since November, 1925, had operated on fifteen cataract cases by the Barraquer method, five of which he exhibited at this time. Seven eyes were operated on in these five cases. The results were uniformly satisfactory, with the exception of one case in which the suction was lost just as the lens was about to emerge. The lens fell back into the eye, there was a slight loss of vitreous, and it was necessary to stop. The lens was still in the eye without there being any hypertension. In three of the cases there was some slight loss of vitreous. He did not wish to place himself on record as being a special advocate of this method of removing the lens in capsule, but he believed it well worth consideration. By the use of the pneumatic forceps the lens was drawn out without any external pressure on the lens. For some time he had used the methods of Knapp and Verhoeff, of traction and slight pressure. The trouble here was that one often failed to get the lens in capsule. He called the method he was now using the Barraquer method, but he used the Miller instrument. With this instrument it was necessary to wait half a minute before the required amount of pressure was obtained — a half minute which seemed pretty long, as those familiar with cataract operations would appreciate. If this wait could be avoided so that the extraction could begin immediately, it would be a great advantage. He followed the Barraquer method as closely as possible and performed the peripheral iridectomy with tumbling of the lens—this was a great advantage, as the lens came over the iris and the chances of having an updrawn pupil were greately lessened. He, himself, would be inclined not to lay so much stress on the inflammation or susceptibility of the patient to lens protein as on the danger of glaucoma and the danger brought about by the necessary needling.

Dr. O. B. Nugent (closing) called attention to the particularly good results which had been obtained by Dr. Woodruff in the cases presented this evening. One of the outstanding advantages of the Barraquer operation was clearly shown in these cases—the beautiful round pupil and consequently the lack of drawn up pupil so frequently seen in other operations.

Study of Experimental Coloboma in Rabbits (Lantern Demonstration).

Dr. Frederick A. Davis read a paper on this subject.

Discussion. Dr. Myron Strong (Profesor of Antaomy, Loyola University School of Medicine) said that when he was asked to participate in this discussion, it had been suggested that he discuss it from the standpoint of genetics. There were two outstanding features in the work of Guyer and Smith which were of general biologic interest; one, that the eye defects were inherited according to Mendel's law, the other, the evidence of inheritance of acquired characters. There was one great gap, however, which had been supplied by the admirable work of Dr.

Davis, i. e., this histologic study of eye defects.

Most of us were brought up with the orthodox conception of continuity of the germ plasm. According to this doctrine, no new characters could arise except by modification of the germ plasm; furthermore, changes in environment and effects of use and disuse were not heritable. For example, an eye specialist could develop a very fine technic, but his son must start at the beginning and learn that technic all over again, it could not be transmitted to him by simple inheritance. It must be admitted that this conception was one of the fundamental contributions to biology, and had served to check much loose thinking. Nevertheless, it had been taken too dogmatically, and there had developed a tendency to consider the germ plasm as incapable of change except thru recombinations of units or genes already in it. But many of us were skeptical. The germ plasm was not in a hermetically sealed case. The spermatozoa and ova were formed in organs which had a good blood supply. The germ cells must be accessible to hormones, antibodies and other materials in the blood stream. There had been, however, a great lack of real evidence in support of such effects upon the germ plasm. There had been contributions from experimental research in support of this idea, but the total amount of evidence had been disappointingly small. Dr. Davis's work must be considered as giving important evidence that the germ plasm was susceptible to changes in the environment. These changes were usually very small, and hardly observable except thru a long period of time, as they occurred in nature, but new conditions might make the process more rapid. Great credit was due Dr. Davis for this beautiful work which supplemented that of Guyer and Smith so well.

Dr. E. V. L. Brown said that his special interest had been in coloboma near the nerve in connection with defects studied by Elschnig some years ago. He had an opportunity to section an eye 24 mm. long, not nearsighted, with a temporal crescent or conus, identical with that usually found in myopia. There was a lack of the inner third of the sclera on the temporal side of the disc. The choroidea was gone, but the retina bridged it over. There were many such cases found of typical crescents in hypermetropic eyes.

Dr. Frederick A. Davis (closing) expressed his appreciation of Dr. Strong's discussion of his paper. He had purposely avoided going into the phase of the subject dealt with by Dr. Strong because he didn't know anything about it, tho Profesor Guyer and he had discussed it. One speaker had brought up the question of bridging across the coloboma. This question had been threshed back and forth by many authors — "Does retina exist across the colobomatus area?" From these specimens he would say it could not exist unless it fell across the coloboma. But so far as he could see, the retina actually did not extend across the defect, tho there were many cases described where it was claimed that the retina in atrophic form bridged the coloboma. Most of the eyes so described were cut in a sagittal direction, and one could not tell anything about the retina in the region of the coloboma when the eyes were so sectioned. The eye must be cut in the frontal plane. Many reports regarding this point were, in his opinion, valueless for that reason.

Ocular Disorders in Encephalitis Lethargica.

Dr. M. L. Folk read an entrance thesis on this subject. See p. 676.

C. Loeb,
Secretary.

MINNESOTA ACADEMY OF OPHTHALMOLOGY.

March 12, 1926.

Dr. D. L. Tilderquist, presiding.

Embolism of Central Artery of Retina.

Dr. J. S. Reynolds reported the case of E. D. R., aged 32, who jumped from a standing box car to the ground. Everything appeared black for a few seconds, after which he discovered there was no vision in the left eye.

When seen about two hours later the right eye was apparently normal and the fundus of the left eye showed a blocking of the central retinal artery. The arteries were bloodless and the veins collapsed but contained remnants of blood. Vision was nil. The macula never showed the characteristic cherry red spot.

Now there was an edema of the macula, with some indistinctness of the scleral ring. There was some evidence of returned circulation thru anastomosis.

The patient gave a history of having an organic cardiac lesion and is now having a general physical overhauling.

Discussion. Dr. Fulton stated that cases of this kind that came under his observation had turned out badly, altho favorable results had been reported by Dr. Casey Wood, Dr. Harry Würdemann and others, which were brought about by deep and persistent massaging of the eyeball, causing the embolus to pass on and lodge in some of the small branches of the retinal artery.

Dr. Litchfield said that he had a patient who gave a history of suddenly noticing he could not see. Hot applications and massage were used. In about an hour vision was again good. A few minutes later he suddenly went blind again. When Dr. Litchfield saw the patient he had a very definite embolism; the red spot was still present but was beginning to fade. Dr. Litchfield stated that the patient was still blind.

Dr. Spratt said that an interesting feature of the case was that the eye specialist who first saw this patient advised removal of the turbinates and clearing out the ethmoids.

Herman Jacob Knapp.

Dr. John S. Macnie read a paper on this subject.

The Sensory Pathways of the Eye and Their Disorders. (A Study in Structural and Functional Neurology.)

Dr. Howard McI. Morton read a paper on this subject. Numerous lantern slides were shown.

Discussion. Dr. Fulton said: "It is claimed that if Helmholtz were living today and would rewrite his famous treatise, he would change the name to psychologic optics since in the final analysis of many of the present day physiologists, visual sensations are bound to be in the brain rather than in the retina, as form sense, discriminating sense and sense of position are now looked upon as phychologic phenomena. The application of all or none principle, as worked out by Adrian, has cleared our views on this subject greatly, viz., that a single nerve impulse is an absolute thing and cannot vary in size; so, in explaining eye function, single sensory fibers when stimulated are capable of conveying to the brain impressions both of intensity and color; thus in the perception of just visible points, such as a small star, both the color and the intensity of the stimulus can be ascertained. Helmholtz demonstrated, and Sherrington has since confirmed, that the actual size of a just visible point corresponds almost exactly to the diameter of a foveal cone. It is interesting to remember in this connection that there are undoubtedly histologic interconnections in the molecular layers of the retina between the rods and cones and, according to Barker, there are one million medullated nerve fibers in the optic nerve and a corresponding number of rods and cones; and, according to Howell, each cone in the fovea connects with a single nerve cell and in all probability with a single nerve fiber in the optic nerve.

This subject has a practical application in the treatment of muscular insufficiencies and muscular anastomoses.

As in doing the Motais operation for the relief of ptosis, we leave but a few fibers of one of the muscles; but, on the principle of all or none, we leave the same motor and nerve power remaining in the muscle from which we remove the fiber.

W. E. Camp,
Recorder.

COLORADO OPHTHALMOLOGICAL SOCIETY.

MARCH 20, 1926.

DR. D. G. MONAGHAN, presiding.

Trachoma.

DR. CLARENCE E. SIDWELL showed Mr. M. L. D., who sought relief of pain in his left eye. He had had trachoma, bilateral, for five years. There were old scars in the tarsal region of both upper lids and a few follicles in the upper fornices. The lower lids were thickened and had the characteristic velvety appearance. The fornices were shallow. There was pannus of the left eye and a corneal ulcer of the limbal margin at three o'clock.

The ulcer was cauterized and after it was healed the lids and fornices were rubbed vigorously with a firmly wound applicator dipped in 1-500 bichlorid of mercury. This was done under cocain anesthesia at intervals of four days for a period of ten weeks. At the end of this time no follicles could be seen. Corneal ulcers occurred three times during the above period and responded in each instance to cauterization with phenol and the use of atropin.

Infected tonsils were removed and a submucous resection done to establish better drainage. The patient is more comfortable now than at any time for the past three years.

Discussion. DR. MELVILLE BLACK has followed Kuhnt in this type of case in doing an excision of the tarsus. He uses the method of Kuhnt as modified by Fox and deals with entropion at a separate operation.

DR. G. L. STRADER uses a Gifford forceps for the expression of the follicles. He has never seen a case complicated by pannus, in which the pannus did not clear up after careful expression of the follicles and the use of copper sulphate.

DR. W. C. FINNOFF stated that trachoma is frequently diagnosed when not present, especially being mistaken for follicular conjunctivitis.

DR. JOHN MCCAW follows the treatment as outlined by Fuchs, using silver nitrate in the acute stage and copper in the chronic stage.

DR. C. A. RINGLE said he has seen advanced cases with pannus, corneal ulceration and numerous trachoma follicles. He expresses the follicles, with a Gifford forceps, then rubs the conjunctival surfaces with 2% silver nitrate which is afterward neutralized with salt solution. This treatment is continued for weeks and months.

DR. F. R. SPENCER has seen many cases of vernal conjunctivitis diagnosed trachoma.

DR. C. H. EVANS believes that many cases of trachoma so diagnosed are simply papillary hypertrophy. After a wide experience in Egypt, he uses silver nitrate in two, three and four percent strengths followed by a 1-5000 perchloride wash.

Burn of the Cornea.

DR. C. E. SIDWELL exhibited Mr. E. P. L., a case of marked corneal destruction of the left eye following a burn with muriatic acid and zinc chlorid.

Monocular Trachoma.

DR. W. C. FINNOFF demonstrated a case of monocular trachoma in a man, aged 24, who had all of the characteristic features of a subacute trachoma. He suggested that perhaps a tissue reaction prevented the development of trachoma in the other eye.

Discussion. DR. MELVILLE BLACK thought that a monocular trachoma was always worse and the symptoms more aggravated than in a binocular affection, and that infection of the other eye would not occur.

Retinal Detachment and Vitreous Changes Following Magnet Extraction.

DR. JAMES M. SHIELDS showed Mr. T. O., aged 25, machinist, from whose left globe a piece of steel was removed by magnet extraction after Roentgen ray localization. The point of entry was at three o'clock just inside the temporal limbus. A conjunctival flap was made at the temporal side of the globe just above the level of the external rectus muscle. After a scleral punc-

ture, the tip of a hand magnet was introduced and the piece of steel removed without difficulty. Atropin ointment was used and the eye firmly bandaged. On the second and third days following, 3 and 5 c. c. respectively, of milk were given intramuscularly; atropin was continued for five weeks, after which the patient returned to his work.

Fourteen months after the date of the injury, the cornea showed the scar at the point of entry; linear opacities on the posterior capsule of the lens; the vitreous filled with heavy shreds whose main direction was horizontal, radiating toward the mid line and up and down in the temporal fundus; globular detachment of the retina at the site of the scleral puncture in the extreme temporal part of the fundus; areas of detachment below this site extending as far as the lower mid line and white streaks extending from the main detachment into the lower fundus.

Discussion. Dr. Melville Black and Dr. W. A. Sedwick thought the prognosis was bad, because of probable additional retinal detachment.

Dr. W. C. Finnoff believed the area of detachment was definitely raised and that the black streaks in the vitreous were the results of hemorrhages which, when they occur from the ciliary body, radiate in a fan shaped manner from that structure.

Centarl Chorioretinitis.

Dr. J. M. Shields showed also a case of central chorioretinitis in the left eye of R. R., male, aged 11 years. Poor vision in this eye was noticed on Feb. 4, 1926, in shooting an air gun. Complete physical examination revealed nothing suggesting pathology except diseased tonsils, which were removed.

On first examination, the right eye was normal. V. = 20/20; the vision of the left eye was less than 20/200. The macular region showed an edematous area of about 2 disc diameters. It was very slightly elevated and beneath it could be seen a few small pigmented areas. There was an absolute central scotoma about 7 degrees in diameter. On examination today, six weeks later, the edema has disappeared, but in the macula are numerous small pigmented spots with probably permanent destruction of retinal elements in the macula. The absolute central scotoma has remained unchanged.

Discussion. Dr. W. C. Finnoff answered Dr. Black's question as to whether or not in this case a von Pirquet would exclude tuberculosis, in the negative.

Retinitis Pigmentosa.

Dr. Wm. M. Bane exhibited Mr. J. L., aged 23, who first called May 7, 1923, for refraction. He stated that his vision had always been poor, and especially so at night. He has two brothers whom he stated have the same trouble. His parents' eyes are normal. Vision O. D. and O. S. 5/30. The media were clear and the discs normal. At the periphery of both fundi was a deposit of pigment, suggestive of retinitis pigmentosa. The retinae had an atrophic appearance. The fundus has remained unchanged.

Extensive Degeneration of Choroid and Retina.

Dr. Wm. M. Bane brought a girl, aged 7, who has had poor vision all her life. The parents and two other children are healthy and have normal vision. The patient had a very large area of degeneration of the choroid and retina at the temporal side of each disc and very near it. The discs were atrophic and there was a marked lateral nystagmus. The vision was 1/60 O. D. and O. S., improved to 1/15 with corrective lenses.

Discussion. Dr. F. R. Spencer thought that Dr. Bane's second case was one of bilateral congenital coloboma of the choroid.

Dr. C. E. Sidwell exhibited an instrument he has devised for eversion of the upper lids. It is double armed so that one end is used for the eversion of the right lid and the other end for the left lid. It allows perfect control of the lid in eversion with one hand.

Donald H. O'Rourke, Secretary.

St. LOUIS OPHTHALMIC SOCIETY.

March 26, 1926.

Dr. J. F. Shoemaker, Presiding.

Changes in Refraction in Diabetes Mellitus.

Dr. Lawrence Post read this paper which is published in full on page 666.

Discussion. Dr. N. R. Donnell said that he had a case under observation similar to those reported by Dr. Post. A young woman who had previously been hypermetropic came in complaining of vague symptoms. He found that at the age of 46 she was doing office work with no apparent discomfort. She was referred to an internist for examination who reported sugar in her urine. He had not gone over her refraction as carefully as he might because she had not complained but there had been quite a change in her refraction. He had not succeeded in getting her sugar free and so could not expect a return to her previous hyperopic state.

Dr. J. F. Hardesty discussed the question of the age of these patients. Some years ago he had seen in consultation a boy of 18 with diabetes who said he could not see distinctly across the room whereas he had always been able to see well at a distance. He had to hold his reading very close to him. Measuring his refraction with an ophthalmoscope, he seemed to have about 6 or 7 diopters of myopia. Two or three weeks later, when he was getting nearly sugar free, he had about three diopters of myopia measured with the ophthalmoscope. Recently he had examined a student at the medical school about 23 years old who said "I haven't been able to see well recently." He was then about 1 diopter myopic and his vision was 20/100. The record of the physical examination made six months previously at the university showed vision of 20/40. His blood and urine were examined. The urine was normal, but the blood showed a very slight rise in the sugar content.

Dr. F. W. Hardy felt that one point Dr. Post mentioned was of especial interest, viz: that the astigmatism changed little if at all. This confirms the opinion that astigmatism is generally resident in the cornea and that a disease such as diabetes mellitus which may cause a variation in the shape of the lens or an alteration in its index, does so in a rather uniform manner.

Dr. Wm. H. Luedde said that he had noticed a change in refraction several times in diabetes, but there was one striking instance which remained fixed in his memory because of the unusual setting. He had examined a woman between 50 and 60 years old and found she had incipient cataract. He took this matter up with the family physician who told him she had diabetes, and that he had a hard time controlling her, but with the statement she had a cataract he thought he could get her to be more strict about her diet, regular rest, etc. Her central vision was good, when corrected by +1.50 spherical, She required +2.50 addition for reading. With a little urging on his part and on the part of her physician she consented to take several days rest at home and to follow the treatment he prescribed, and she observed a strict diet. He was called suddenly to see her because she had "lost her sight." Ophthalmoscopic examination showed a hyperopia of 4 or 5 diopters instead of 1.5. Her hypermetropia must have increased when she was under treatment. That fully agrees with the hypothesis Dr. Post brought out in his report. Dr. Luedde had assumed the change was due to a variation in the refractive index of the lens. Following Dr. Post's argument he felt sure the explanation in her case was that as she had been put under restrictions as to diet and given treatment, there was a response which rendered her less saturated with sugar and her lens became more nearly normal. He saw her once after that and did not change her lenses.

Dr. E. H. Higbee asked Dr. Post if all cases developed this condition suddenly. He had seen a case whose refraction had been +0.5 in one eye and

+0.62 cyl. in the other eye. Her refraction had suddenly changed to —1.50 with a small amount of cylinder in one, and —1.00 with the same cylinder in the other eye.

Dr. M. H. Post said that the first paper he ever wrote was on this subject. The patient was sent to him by Dr. Soper because of trouble with her eyes. Her glasses, prescribed by Dr. Post one month before, were no longer satisfactory. He found her hypermetropia increased about 1 diopter. Dr. Soper stated that she had had sugar in the blood and urine, but that the urine was now sugar free and the blood sugar was about normal. Evidently, the increased refraction had come on as the sugar disappeared. In about three or four months the refraction returned to normal and it remained so until her death, despite the fact that diabetes again set in. He was able at that time to find twenty cases with increased hypermetropia from this cause. He saw the first case reported by Dr. Lawrence Post, and was greatly impressed by the sudden change in her refraction.

Dr. C. W. Tooker said that he had notes of a case quite similar to the one reported by Dr. Post, but that the refraction remained hypermetropic after the continued reduction of sugar in the urine. This patient is 48 years old. In December, 1923, and in December, 1924, her refraction measured +1.00 right and left. In January, 1926, her eyes were almost emmetropic and he could discover only a few retinal hemorrhages in the left eye. Her urine was sent to the laboratory and found to contain sugar. On January 27th, after she had been under the treatment of an internist two weeks her refraction measured right +1.75 and left +2.00. The internist reported she was sugar free. Two months later her refraction still measured +1.75 in the right eye and +2.00 in the left, with no sugar in her urine. Following the theory explained in the paper, she developed myopia with the presence of sugar in her urine; with disappearance of sugar she developed hypermetropia in excess of her normal refraction and has maintained that for a period of two months.

Dr. F. W. Woodruff asked whether astigmatism was verified with the ophthalmometer to determine whether it was corneal or lenticular.

Dr. Lawrence Post in closing said that even tho two months has elapsed since Dr. Tooker's patient showed change in refraction he may yet return to his former correction. If Duke-Elder's hypothesis is correct, the first change in refraction is almost certain to occur suddenly. Dr. Hardesty's patients were very young for diabetic changes of refraction but there are a few between 20 and 30 years reported in the literature. The astigmatism was measured only once on the ophthalmometer. The variations in urinary sugar are only indirectly related to the changes in refraction because according to the hypothesis, it is the unusual composition of the fluids bathing the lens that causes the change in its shape.

Corneal Pannus Treated with Thermophore.

Dr. E. H. Higbee presented the following case report: R. W., aged 23 has had his eyes treated by a number of doctors for the last ten years, but with very little relief. No operations. Right lid shows a slight ptosis, left, normal position. He has a marked trachoma in both eyes. On the right cornea there is a slight pannus and at the sclerocorneal margin surrounding about ⅓ of the cornea is a growth that consists of a large number of round follicles giving the appearance of adenoid tissue. On May 12, 1925, a Knapp roller operation was done on the right lids and on May 16, 1925, a similar operation was done on the left lids. The lids healed nicely, but the pannus and growth showed no improvement. He came in at intervals from July 25th to Feb. 26, 1926, but would not consent to any operation, altho the growth and pannus had increased until about ⅔ of the cornea was involved. Dr. Shahan examined the case in consultation and thought good results might be obtained by using the thermophore. March 2,

1926, Dr. Higbee applied the thermophore for one minute at a time on three different points, at a temperature of 140 degrees F. For a few days there was quite a bit of reaction, but the patient said he had no pain after 3 p. m. of the day it was applied. Application was made at 11 a. m. Today, March 26, 1926, the growth has entirely disappeared and the pannus as well. The iris which could not be seen before the operation is distinctly clear to the limbus now and his vision has improved materially.

Discussion. Dr. Wm. H. Luedde asked if there was any other treatment.

Dr. W. F. Hardy said that some years ago he had a patient with a trachomatous ulcer in his only eye. Various measures were tried but with no improvement. In desperation Dr. Shahan's thermophore was used for one minute at a temperature of 142° F. Much to his gratification, the process immediately abated and the ulcer began to heal. A considerable amount of vision was saved in an eye which looked to be doomed.

Dr. E. H. Higbee in closing the discussion said that he applied the thermophore one minute at a time at three points to cover the entire surface of the growth; this was done all at one sitting. The anesthesia was cocain locally and cocain with adrenalin injected under the conjunctiva. There was no other treatment except to cleanse the eye with boric acid solution, nothing in fact that would interfere with getting the entire and sole effect of the thermophore.

Chas. W. Tooker, Editor.

ROYAL SOCIETY OF MEDICINE, LONDON.

Section of Ophthalmology.

May 14, 1926.

Sir Arnold Lawson, K.B.E., President.

Owing to the universal strike, facilities for the meeting were much curtailed and Mr. Rayner Batten saved the situation by demonstrating, by means of the epidiascope, a number of drawings illustrating, first:

Black Spot Choroiditis.

Mr. Batten said he was drawing attention to a fundus disease which had not, so far, received due attention from either the clinician or the pathologist. Central black spot was a lesion met with in myopia, and was commonly associated with that disease as it was a frequent cause of myopia. It was not limited to myopia, however, as it occurred also in hypermetropia. It was not limited to the macula, but was confined to the central area, that embraced by the superior and inferior temporal vessels. He, himself, recognized three forms of black spot choroiditis, in one of which the onset was acute; it occurred in the macula, and the whole process took place with dramatic suddenness, the area around the black spot becoming quickly atrophied. Hemorrhage might or might not accompany this. In his experience, hemorrhage had never been a marked feature of the condition. In the second class the onset was not so acute as in the first, there was a tendency later for the area of choroidal atrophy to shrink, and the tag of pigment to get smaller. In this second form it might be difficult to focus the macula, and, subsequently, a diffuse hemorrhage might be found. The formation of the black spot and the area of atrophy might occupy weeks, even months. The eye might regain some useful vision. In the third group of which he showed drawings, there was not necessarily loss of vision.

Senile Retinochoroidal Atrophy of the Macula.

Mr. Batten considered this a definite class of macular disease. The first few cases of the kind which he encountered showed some evidence of mental or cerebral disturbance, and his idea then was that there was an association of macular disease with cerebral degeneration in the young, and that it would be reasonable to expect the same in the adult, and still more in the old. In subsequent cases, however, physicians declared nothing was amiss with the cerebrum, but these patients were all subjects of arteriosclerosis, apart from which they were in good general

health for their age. The condition he was describing occurred in the old as well as in the young, and it was of long duration and slow formation, being markedly symmetric in the two eyes. It occupied the macular area, and was more or less of ringed or discoid shape. The superficial layers of the choroid were wanting leaving choroidal vessels running across the base. The margins showed retinal changes, with a fine pigment loss, and this he regarded as evidence of retinal disease. In most of these cases the vision was very bad. The symmetry could, he thought, be taken as evidence of constitutional disease. In contrast to the drawings of the condition mentioned, he showed several of sarcoma, and pointed out the ophthalmoscopic differences.

Discussion. THE PRESIDENT said three of the cases of which Mr. Batten had shown drawings were patients of his, and in two of them, at least, the teeth were in a very bad condition, and on the mouth being cleared of the offending foci the process in the eye stopped. He had always regarded the presence of pigment as more a sign of inflammation than of hemorrhage. In regard to the first series of drawings shown, he had not associated myopia causally with the condition.

MR. J. H. FISHER referred to the great importance to vision of adequate nutrition of the retina at the macula, the capillary network being more dense there than elsewhere for that reason. The pigmentation which Mr. Batten had demonstrated, he, the speaker, regarded as an accumulation derived from the pigment layer of the retina, and the disorder of pigmentation was probably a result of imperfect nutrition of that layer by the choriocapillaris on which it depended. The striking difference between the first and the second classes of cases which Mr. Batten showed, seemed to be that in the sclerotic cases there was atrophy of the choriocapillaris conspicuous over the central circular area, with an accumulation of pigment at the periphery, and little or no pigment where the choriocapillaris was obviously deficient over the major part of the area. But in the myopic cases there was an area of choroidal atrophy forming a framework, and in the center of that area was an accumulation of pigment. In looking for an explanation of the major difference in the two classes of cases it seemed possible that where, in the arteriosclerotic cases, there was obstruction of a branch of an artery which conveyed blood to the choriocapillaris, the blood was cut off except at the periphery, and at the periphery the choriocapillaris circulation was at a low ebb; so that over most of the area in the arteriosclerotic cases there was no nutrition of the pigment layer at all; but at the periphery, where the choriocapillaris was functioning, but functioning badly, the pigment cells would resent the condition of things and there would be an accumulation of pigment at the spot concerned. In regard to the myopic cases, in them there was a liability of fissures to occur in the choroid coat, and if a combination of such fissures formed a circular crack, conditions would favor choroidal rupture. If that were so, one would not expect any pigmentation at the periphery, but there would be an area of choroidal atrophy showing itself after a short time.

MR. TREACHER COLLINS said he thought it was generally recognized that these black spots at the macula were due to hemorrhage. He had seen what looked like hemorrhage gradually pass into a black spot. He thought the blood came from choroidal vessels, and that this was the reason it was so deeply pigmented. Moreover, the onset of the black spot was always sudden, and one would not expect a sudden onset of pigmentation due to melanin in the retina. It was one of the complications likely to occur in high myopia, and it led to sudden loss of central vision. Still, it was something to be able to console these patients that they would not lose their vision entirely. The other set of cases of which Mr. Batten showed drawings might be due to a variety of causes. It was remarkable that in them the sclerosis seemed to be confined to the choroidal vessels going to the macula;

that the whole macula was not concerned. He had not heard any explanation of that.

Mr. H. R. Jeremy spoke of the case of a boy aged 17, who had high myopia. He was blind in one eye, and, at a dance, he suddenly went blind in the other. In one eye was a black spot at the macula, in the other, a large hemorrhage below the macula. He put the boy to bed for six weeks, at the end of which time he had recovered sufficient vision to enable him to get about. But the spot had become blacker.

Mr. J. F. Cunningham spoke of a myopic patient who, in 1910, had 6/9 vision, and myopia —10. She developed coal-black spots rather rapidly, and in one eye she had a circular shaped detachment. Since the war, in place of the dark spot, she had developed a large area of choroidal atrophy, with sclerosis of vessels.

Mr. Batten, in reply, said the peculiarity was the dramatic suddenness with which the black spots occurred. If the condition was preceded by hemorrhage, it might be that pigment became dislodged.

H. Dickinson, Reporter.

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RETINOBLASTOMA.

Names are given for convenience, to associate things alike and to discriminate between those that differ. Common and important diseases were recognized and named by their differing clinical characteristics and locations, before any one had looked thru a microscope, or knew the biologic significance of a cell. When Virchow formulated the doctrine of every cell originating from a parent cell, he opened the way to a better understanding of the nature of tumors. But he did not abrogate their clinical characters. When he supposed that the tumor he found in an eye sent to him by Graefe was similar to the tumors of the brain, arising from proliferation of glial tissue, he made a mistake. He did not know how widely they differed in essential characteristics; and his mistake has caused great confusion as regards the naming of the retinal tumors that arise in infancy.

More than a century and a half ago was published a description of a case, perfectly recognizable as similar to the one that Virchow called a "glioma of the retina," or the one that Flexner called a "neuroepithelioma retinae." In medical literature there had appeared many reports describing this one disease, but giving it many different names, before Virchow in 1854, called it "glioma of the retina," and this name became a stumbling block for students of the subject. Becker in 1873, insisted on the similarities of these tumors to sarcoma, just as Parker, Stokes and Warthin have done this year. Becker called it a tubular angiosarcoma, and figured a typical "rosette," supposing his case not to be a typical one; and he suggested calling it neuroepithelioma, tracing the rosette to a rolled up part of the rod and cone layer.

Wintersteiner, 1879, showed that Flexner's case was typical; and adopted the name "neuroepithelioma" as a better name for what Virchow had called "glioma" of the retina. Since then other names have been suggested for this disease, but the most important are retinocytoma, suggested by Mawas; and retinoblastoma proposed by Verhoeff and favored by Mallory and Feingold.

Malignant tumors show this common difference from all normal tissues of the body: They consist of cells which are without power of performing any function which is useful to the body as a whole. They have reverted to a primitive type, in which the whole

power of the cell is devoted to increase in bulk and multiplication. This character marks an early stage of development, an embryonic condition, of all tissues of the body.

A tumor composed of "germ cells" is called a blastoma, from the Greek **blastos** a germ. The anlage, or foundation of each organ is composed of such germ cells. When they have grown and multiplied enough to furnish a sufficient bulk to meet the needs of the body for that organ, they develop the normal tendency to specialize into cells that will perform its function. Thus certain cells develop to perform the function of nerve cells. If the cells that should do so fail to develop such special characters; or if some of them fail in this development, but simply continue to grow and multiply like germ cells, they constitute a tumor called a neuroblastoma.

Mallory's plan of recognizing the point of origin and germ cell characteristics of tumors, by calling them blastomas, is being widely adopted by pathologists. He classed the tumors we are considering as neuroblastomas. But in this class are other tumors, arising in other parts of the nervous system and differing essentially from the retinal tumors, in their clinical course and characteristics. If it were proved that these retinal tumors developed from germ cells intended to give rise to the glial tissue of the retina they might be called glioblastomas. But this is not proved; and it is not likely that they do develop chiefly from those germ cells. If they did, the term would still be a poor one, because it would apply equally to the gliomas of the brain, optic tracts and chiasm; which are totally different in their clinical courses and tendencies.

The terms neuroepithelioma and retinocytoma are not appropriate, because the tumors in question do not consist of cells of neuroepithelium, or of cells like those found in any part of the retina, after the fifth month of fetal life. Moreover, neuroepithelioma has been applied to tumors of wholly different character, arising in different parts of the central nervous system. The inappropriateness of calling a tumor retinocytoma, that does not contain anything looking or staining like retinal cells, is emphasized by the persistent efforts to call these tumors some kind of sarcoma, because the mass of cells of which they are composed, look and stain so much like those of socalled round cell sarcoma.

The term retinoblastoma indicates the kinds of cells that are found in all such tumors, at all stages and in all parts of the body. The "rosettes," for which Mawas has proposed a new name, "stephanocytes" (from their resemblance to a crown) are only found in the primary tumors, developing within the eyeball; and they are well developed in less than one-third of the cases. It is the same kind of tumor, running the same course, showing the same malignancy, whether the "rosettes" are present or not. We do not want one name for the tumor in the eyeball, and another name for the metastatic tumor following in the liver, or humerus. When Morax admits that retinoblastoma is appropriate to the tumors that do not contain "stephanocytes," he virtually admits that this is the name most appropriate to all the secondary and most of the primary tumors of this class.

At its meeting this year, The American Ophthalmological Society adopted the report of its committee on this subject which recommended: "That the term Retinoblastoma be hereafter used to designate the tumors heretofore designated as Glioma of the Retina, Gliosarcoma, Medullary Cancer of the Retina, Neuroepithelioma Retinae, Retinocytoma, etc." and "That the Publication Committee be instructed to use it, either as the primary or secondary designation of such tumors, in the transactions." There is much reason that, until the new term has become familiar to readers, one of the old ones should accompany it by way of explanation; and this will be the editorial policy of the AMERICAN JOURNAL OF OPHTHALMOLOGY.

E. J.

PTERYGIUM AND ITS TREATMENT.

The name of this condition, given because its shape resembled a wing of a bird or insect, has relation to something deeper than the mere form of its outline on the cornea. The outline is characteristic of these growths. Sometimes the wing is narrow, sometimes broader; but whether the lesion began with a wound involving the limbus, with repeated slight injuries to the parts, or to more subtle pathogenic influences, its development always causes it to assume more or less this shape. It is fair to assume that the shape of a pterygium, has some fundamental connection with its essential pathology.

The shape seems to be determined by the development of the vessels in the growth, those in the middle, being most under the pathogenic influence, push farther out on the cornea, while the whole edge seems to keep an even smooth border, resembling somewhat that of the normal corneal limbus. We speak of the vessels as if they were a single and separate element in the growth. But each blood channel is the axis of a trophic and nutritive system. Artery, capillaries and veins, together constitute a blood channel; but each is surrounded by a lymph space, even more directly connected with the fluid nutritive to the tissue. Moreover, each vessel system has its associated army of endothelial cells and fibroblasts, "germ cells" from which new formed vessels and socalled connective tissues originate.

The close association of vascular distribution with tissue development is noticeable in many new growths, especially in sarcomas and the characteristic cell areas of retinoblastoma; and it has been studied in the formation of granulation tissue, produced experimentally or by disease. It is strikingly illustrated in the changes that follow hemorrhage into the vitreous. If the blood clot remains unconnected with an important vessel, it is likely to liquefy, become decolorized and finally to disappear by absorption. But if it is in relation to one of the vascular trunks, fibroblasts invade it, new formed connective tissue and vessels develop in it, and a case of retinitis proliferans is discovered.

The clinical facts regarding pterygium are best understood by bearing in mind the relations of the growth to its vascular supply; and the treatment centers about the modification of its supporting vessels. Very small pterygia may be destroyed by excision or cauterization of the growth. But successful treatment of more important cases depends on control of the tendency to the special vascular development. This tendency may be thought of as in a sense malignant. The malignancy is strictly local; as is tendency to the development of glial tissue in glioma of the brain or optic nerve, where it forms masses fatal by pressure on neighboring parts. In pterygium the tendency is to local recurrence, until the development of scar like tissue has covered the pupil, or has bound down the eyeball so that its movements are limited and binocular vision is prevented.

The objective of treatment is the changing the relation of the nutritive vessel system of the pterygium to the cornea. This has been done in various ways. The corneal part of the pterygium may be dissected up, the scleral part undermined and the tip carried underneath so that the vessels are turned away from the cornea instead of toward it, and the aggressive fibroblasts and endothelial cells become quite harmless. There seems to exist a keratotactic influence which draws on the abnormal development, so long as the vessels are turned toward the cornea, which no longer operates when they are turned elsewhere. The normal purpose of such a tendency might be the development of the normal structures of the limbus to secure the nutrient supply of the avascular cornea. Its excess, producing the pathologic structure, a pterygium, seems to be controlled by changing the direction of the vessels.

Knapp's operation split the pterygium, directing the vessels of the upper part to the upper cul-de-sac, and those

of the lower part to the lower cul-de-sac of the conjunctiva. The McReynolds operation turns them all down beneath the lower cul-de-sac; and seems to be the simplest effective operation for many large pterygia. The value of the operation described in this number by Major Spaeth might be doubted by any one who did not appreciate the importance of direction of these vascular nutritive systems. But when this dominant factor in the pathogenesis of pterygium is properly considered, this method of changing the direction of vessel development may appear the most rational, simple, effective method that has been yet proposed; and particularly suited to those cases, that have been complicated by previous unsuccessful operations.

For any of these operations success depends: First, on getting rid of all the aggressive endothelial cells and fibroblasts of the vascular systems, that have become established on the cornea. Second, on turning the vessel systems in a new direction away from the cornea. Third, on placing, between the denuded area of the cornea and the redirected vessels, a barrier of normal conjunctiva at the corneal limbus; that will manifest no tendency to send out granulation loops and tissue toward the cornea until it has become quite healed. The character and the neat adjustment of the tissue left in juxtaposition to the denuded cornea, securing the quick binding of conjunctival epithelium to firm deep tissue, without any colonies of evilly tending fibroblasts between, is the coup-de-grace for a pterygium. E. J.

A MASTER OPHTHALMOLOGIST

In 1887 there came to this country for the first time, as a visitor and prominent participant in the Section on Ophthalmology of the Washington International Medical Congress, a man who was already at the top of his profession in France. The writer then met him, making some drawings for his lectures before the Congress. A firm friendship was then established and kept up by correspondence and mutual visits both in Europe and in America. His visit to America several years ago as the guest of the American Medical Association, and particularly that of the Section on Ophthalmology, was an event to be remembered by all who met him.

Doctor Edmond Landolt was in his prime, from the beginning of his career as an ophthalmic surgeon and author to the day of his death. He was a voluminous writer; his style clear, and his contributions of such value that they were quoted, translated and reproduced in all civilized languages. His books and work are alive and will remain so for a long time. He passed away at his house on the Rue de Berri in Paris on the 9th of May in his eightieth year.

"Heureux sont dés á présent les morts qui meurent sans le Seigneur! Oui, dit l'Esprit, car ils se reposent de leurs travaux et leurs oeuvres les suivent." Apocalypse XIV-13. ("Blessed are the dead which die in the Lord from henceforth! Yea, saith the Spirit, that they may rest from their labours; and their works do follow them.")

He leaves his wife, Madame Edmond Landolt; his son, Dr. Fernand Landolt, Officer of the Legion of Honor, French and Belgium Croix de Guerre; his son, Dr. Marc Landolt, Chevalier of the Legion of Honor, and Madame Marc Landolt; his son, Jacques Landolt, and Mademoiselle Antoinette Landolt.

Monsieur le Docteur at the time of his death had the following titles: Oculiste Consultant Honoraire de l'Institution Nationale des Jeunes Aveugles, Officier de la Légion d'Honneur, Citulaire de la Médaille de 1870-71, Commandeur des Ordres d'Isabelle la Catholique, de la Couronne d'Italie, de l'Etoile de Roumanie, de l'Osmanié, Officier de l'Ordre du Lauveur de Grece.

We mourn him who is gone before; his older friends must expect soon to follow.

Harry Vanderbilt Wurdemann,
Seattle, July 1, 1926

BOOK NOTICES.

Anomalies and Diseases of the Eye. Nettleship Memorial Volume, Part II, Color Blindness. Julia Bell, M.A., M.R.C.S., L.R.C.P. Paper, quarto, pp. 125-268. Frontispiece and plates 27-41, pedigrees 367-602. London, Cambridge University Press, 1926.

This is the second volume of the Treasury of Human Inheritance (a phrase worth remembering) edited by Karl Pearson, F.R.S. and put out by the Francis Galton Laboratory for National Eugenics of the University of London. In the literature of heredity the name of Nettleship deserves to be associated with that of Galton; and that of Karl Pearson naturally belongs close to the others. This work constitutes a magnificent memorial, to which its scientific value gives solidity and assurance. Such a memorial calls up the name of the artist who has traced its lines and given it color. Julia Bell will be remembered in this connection. A fine touch is added in the frontispiece, a reproduction of an engraving of John Dalton, the great chemist whose defect of vision made "Daltonism" a synonym of color blindness.

This "Part II" is divided into six sections. The first includes, under Color Vision and its Anomalies, these headings: Introductory and Historical; Normal Color Vision; The Solar Spectrum; Structure of the Human Retina; The Association of Retinal Structure and Function in Man and Animals.

Section II, deals with Congenital and Acquired Total Blindness. Section III, on Congenital Color Blindness, includes: Introductory Remarks; Frequency and Geographic Distribution of Color Blindness; Description of Dichromatic Vision; Congenital Color Blindness in Women; Inheritance of Color Blindness. Section IV is a Name Index, to the Chronologic Bibliography and to Authors of Pedigrees. Section V gives Chronologic Bibliography (425 titles); and VI contains descriptions of Pedigree Plates.

The historic notes regarding color vision, given here, run from Alcmaeon (500 B.C.), credited with having first dissected the eye, to Dalton (1794). The later contributions of Young, Helmholtz, Hering and Edridge-Green are not given in this section, as being adequately set forth in Parsons Introduction to the Study of Color Vision and other recent literature and generally accessible. However, the contributions of these and other more recent writers on color blindness, are given in other sections of the work; so that the treatise cannot be regarded as incomplete.

There is an enormous amount of information included in the 236 pedigrees, recorded here in Section VI and graphically set forth in the plates. Despite its inconvenient size of page, the quarto form seems justified in this case, by the importance of these plates which are thus presented with economy of space. This is a work to possess, if one can, and in any case to go to, with confidence that the facts thus far established regarding the character and distribution of hereditary color blindness are here collected with great care and completeness, constituting this a most valuable work of reference.

E. J.

Die bösartigen Geschwülste des Auges. **H. Sattler,** Leipzig. Paper, 8vo., 368 pages, 9 plates and 25 illustrations in the text. Leipzig. S. Hirzel, 1926.

This book presents the ripened experience and study of its author, regarding the malignant tumors of the eye. Its bibliography, of 33 pages, gives the key to the literature of the world on this subject, up to that of the last two years. It seems to be based on the section treating the tumors of the eye, prepared for the Zweifel-Payr handbook on malignant tumors. It illustrates how the best systematic treatises develop gradually, thru the continued study of the author, in preparing new material for revision of a work to which he has previously given his best thought and attention.

The work is not divided into chapters, but by topical headings, that are

placed here and there thruout its pages, from a list from which the arrangement of subject matter can be gathered. Some of these headings include: Lid Carcinoma; Carcinoma of the Conjunctiva and Cornea; Nevus Carcinoma; Lid Sarcoma; Iris Sarcoma; Iris Tumors of Epithelial Origin; etc. These topical headings, which are printed in heavy face type, with a large number of others, not so distinguished from the text, constitute a table of contents. This is supplemented by an alphabetic index, an aid not always found in monographs published in Europe. In this one they are adequate to the needs of a user of this as a book for reference.

The section on retinoblastoma, tumors arising from retinal germ cells, shows an attempt along familiar lines to harmonize with the name "glioma of the retina" the facts of histopathology and clinical observation that contradict it. But the facts are not so twisted as to give a false impression, and conceal the contradiction. The first two sentences about "netzhautgliom" point out its malignancy and occurrence in childhood, in sharp contrast to the similarly named tumors of the central nervous system and optic nerve, which are only locally malignant and appear later in life. The congenital origin and familial tendency to such tumors are also well brought out, by the citation of cases from the literature.

The difference between the cells of the "rosettes" and the supposed atypical glial cells are well shown in Fig. 18. Neither form ever constitutes the mass of such tumors, as is illustrated in Fig. 19, planned to show the appearance and relations of the rosettes; nor do the cells figured as "glial" from the retina, bear much resemblance to those represented in Fig. 24, as found in glioma of the optic nerve. The name retinoblastoma is not mentioned for these tumors, but the facts which justify a renaming of them are very well set forth. (See p. 705.)

In the German, as in the French language, there is now an excellent, up-to-date treatise on the malignant tumors of the eye. This book of Sattler, or that of Morax, might well be translated into English. It would be a work well worth the careful attention and labor of any ophthalmologist. There is little choice between the two, either contains a really good statement of the present knowledge with regard to malignant disease of the eyeball. Indeed both might well appear in English translations, for the circle of English readers would be about as large as both the readers of French and the readers of German works on ophthalmology; and the translation of such a book, with the thoro study of the book and the language, that a good translation compels, would be a profitable expenditure of time and effort for any young ophthalmologist.

E. J.

Research in Progress at the University of Minnesota, July 1924-July 1925. Bibliographical Series, No. 3. Compiled by Clarence M. Jackson, M.S., M.D., L.C.D., Director of the Dept. of Anatomy. Paper, 293 pages. Published by the University of Minnesota, Minneapolis, 1926. Price $1.25.

This book is a bibliography of original work done in the various departments of the university, with the date and the publication in which the papers appeared, with a very brief synopsis. Of interest to physicians are the papers from the department of Animal Biology, Anthropology, Colleges of Dentistry and of Pharmacy and the Medical and Graduate schools.

From the department of Ophthalmology and Oto-Laryngology are mentioned four papers by Dr. F. E. Burch: The Influence of High Blood Pressure in Cataract Surgery, Hysterical Amaurosis and Amblyopia, Tendon Tucking, A Method of Suturing, Retinal Evidence of Circulatory Disease. Dept. of Anatomy: R. E. Scanmon and E. L. Armstrong, The Growth of the Human Eyeball and Optic Nerve; E. J. Borgeson, A Study of the Developmental Topography of the Orbital Region in Fetal Life and in the New Born. Dept. of Obstetrics and Gyne-

cology: F. L. Adair and K. A. Phelps, A Study of Ocular Conditions in the Newborn. Dept. of Pharmacology and Therapeutics: A. D. Hirschfelder, Studies upon the Vascular and Capillary Phenomena and Supposed Axon Reflexes Concerned with the Development of the Edema in Mustard Oil Conjunctivitis, etc.

Graduate School: A. D. Prangen, Early Care of Cross-Eyed Children; J. F. Gipner, The Ophthalmologic Findings in Cases of Multiple Sclerosis, A Study of 100 cases; J. F. Gipner and H. P. Wagener, Coloboma of the Iris, Choroid and Optic Disc, with Detachment of the Retina; J. F. Gipner, Mucocele of the Frontal Sinus Simulating Orbital Neoplasm; also, A Histopathologic Study of the Retinitis Found in Two Cases of Cardiovascular Renal Disease; W. L. Benedict, (1) Treatment of Uveal Disease, (2) Etiology and Treatment of Scleritis and Episcleritis, (3) Bony Tumors of the Orbit; H. I. and W. I. Lillie, Choked Disc in Association With Surgical Mastoid Disease with Apparent Intradural Involvement; W. I. Lillie, (1) Tryparsamide Treatment of Syphilis of the Central Nervous System. Observations from an Ophthalmologic Standpoint, (2) Ocular Phenomena in Acromegaly, (3) Ocular Phenomena Produced by Temporal Lobe Tumors; H. P. Wagener and N. M. Keith, Case of Marked Hypertension, Adequate Renal Function and Neuroretinitis; Mary S. Knight, (1) Melanotic Neoplasm of the Eye, (2) Two Cases of Melanotic Tumors Found in Eyes that had been Enucleated Because of Painful Uveitis with Phthisis Bulbi, (3) A Critical Survey of Neoplasms of the Choroid.

C. Sheard, (1) Some Theoretical and Practical Points of Interest in Visual Optics, (2) Application of a Fundamental Mathematical Equation to Ocular Refraction and Ophthalmic Lenses, (3) On the Effects of Quantity and Quality of Illumination Upon the Human Eye and Vision, (4) Illumination and Its Effects on the Human Eye, (5) Some Fundamental Principles of Modern Ophthalmic Lenses, (6) Note on the Subjective Observation of the Blood Corpuscles in the Retinal Capillaries, (7) On the Chromatic Aberration of the Eye and the Chromatic Variations in the Interval of Strum as Determined by a Subjective Method of Skiascopy, (8) On the Development of a Subjective Method of Skiascopy.

The book contains an index of authors, but no index of the papers written by each of them. This fact impairs its usefulness as starting point for research investigations, but otherwise, the book is a valuable storehouse of information.

C. L.

Visual Field Studies. Ralph I. Lloyd, M.D., F.A.C.S. Surgeon, N. Y. Ophthalmic Hospital, Ophthalmologist to the Cumberland, Carson C. Peck Memorial and Prospect Heights Hospitals, and the Brooklyn Nursery. 124 Illustrations. Published by The Technical Press, New York. See also p. 634.

The reviewer has always impressed students with the value of routine examination of the visual field in all cases of diminished vision with corrected refraction, the visual acuity being below normal, as well as in those cases showing fundus lesions or suspected central nerve disease, and he has endeavored to influence his colleagues with its value. On account of this examination being so time taking, it seems that it is neglected in the average oculist's office. It is believed it is only necessary to make exhaustive and fine tests of the visual field in exceptional cases, and those largely for academic research, such as has been so ably shown in the article of the July issue of the AMERICAN JOURNAL OF OPHTHALMOLOGY on "ANGIOSCOTOMETRY" by John M. Evans.

This book of Ralph Lloyd's is an exhaustive treatise, giving historical review, physiology of the retina, indications when field study should be employed to aid the ophthalmologist and establish an efficient office routine, the various advantages and defects of perimeters and campimeters, the diseases of the corneoretinal level upon the out-

lines of the visual fields, the blind spots and the central and paracentral areas. A valuable chapter is that on the traumatic macula, wherein are discussed the medical and legal aspects, malingering, and cases in which there is a macular defect with little or no ophthalmic evidence at the time.

His theory that squint is always attended by some lesion of the ocular apparatus is enticing and no doubt true of many cases. Various reporters have shown that there is a traumatic hemorrhage in the retina in the eyes of many newborn babies, and that some of these eyes ultimately do not acquire binocular vision and even go on to some form of heterophoria. The reviewer does not accept this lesional theory for squint, and adheres to the opinions of Worth and others that there is here an absence of the fusion faculty, which may in early life be developed, as his experience has shown that a very large number of squinting eyes in children are restored to parallelism and binocular vision is established by correction of the refraction and orthoptic exercises. The use of the campimeter for estimation of squint in these extremely young subjects is to his mind impossible of execution, and is applicable in adult life to cases having a little better than ordinary intelligence.

This book is not wholly devoted to the visual field. It discusses glaucoma, retrobulbar disease, the accessory nasal sinuses, optic chiasm, the hypophysis, the third ventricle, the occipital cortex, mind blindness and hysteria.

"The time has come when perimetry is to take its place in the education and practice of the ophthalmologist and this book is offered to assist in making plain the underlying principles involved, the field traits of diseases, especially those without ophthalmoscopic signs; and to make the practical application productive."

The type and printing are models for textbooks; good black lettering and well printed diagrams. It is recommended to all ophthalmic practitioners.

H. V. W.

Modern Ophthalmology. James Moores Ball, M.D., L.L.D. Late Ophthalmic Surgeon to St. Louis City Hospital, etc. Fifth edition, revised, enlarged and rewritten. Two volumes, cloth, 8vo., 1508 pages, 24 colored plates and 598 illustrations in the text. Philadelphia, F. A. Davis Co., 1926.

No book extant can better claim to represent modern ophthalmology, and the basis for this claim is broader than the mere size or completeness of its unfolding of the subject. In the 22 years since its first appearance, this work has developed. Subjects at first somewhat neglected, have received adequate notice, some that at first were overlooked have received proper attention; and new topics, as their permanent importance was demonstrated, have been placed before its readers. Not that the new edition of any textbook can discuss all the new ideas that have been brought to the attention of the profession since its predecessor was issued, it cannot enter the field of the Journal or Year Book, in keeping the information of the practitioner strictly up to date. But a complete and progressive textbook must, in each edition, show the accession of new topics and new points of view; while some of the things that seemed important to the older generation of readers recede in historic perspective, or entirely disappear from the mass of things that the younger ophthalmologist should be required to learn.

This work was always largely one of associated authorship. In the first edition there were six chapters contributed by such ophthalmologists as Zentmayer, Knipe, W. T. Shoemaker, Krall, Goldberg and Fischer. In this edition several of these have been revised by their original authors. New chapters for this edition have been prepared by Derrick T. Vail on Intracapsular Extraction of Cataract; by William F. Hardy, on Ophthalmic Therapeutics; and by Robert C. Heflebower, on Intraocular Pressure and Tonometry. The assistance of 15 other writers in the preparation of various

sections of this edition is also acknowledged in the preface.

The almost 600 illustrations and the colored plates have been drawn from other books and recent journals, as well as from the practice of the author and his many professional friends. The colored plates used in this work always have been of high excellence. This is sustained in the present edition. Some of them contain, each, as many as 8 different illustrations of pathologic conditions of the eye; and in addition to these, colors are used in many of the illustrations in the text. All illustrations, reproduced from the works of other writers, are credited to their original sources.

The complete list of illustrations constitutes an introduction to the history of ophthalmology, ancient and modern. Kolliker, Schultze, Whitnall, Motais, Schwalbe, Waldeyer, Merkel, Magnus, Elschnig, Leber, Arnold Thomson, Vossius and many others appear on the first page of the list; while, Oeller, Galezowski, Axenfeld, Maddox, Noyes, Stevens, Swanzy, Landolt, Critchett, von Ammon, Czermak, Snellen, Harlan, Hess, Pagenstecher, Collins, de Wecker, Knapp, de Schweinitz, Weeks, Fuchs, Reute, Donders, Jaeger and many others, are all thus associated with the building up of modern ophthalmology.

In comprehensiveness this comes nearer to the encyclopedias of ophthalmology than any other textbook. One might make it his chief book of reference, and find it worth going to in all the common emergencies of case study. It is a book worth owning; and he who does not possess an earlier edition has now the opportunity to get what the earlier editions contained with many valuable additions. E. J.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Aubaret. The Efficacy of Measures Against Trachoma. Antitrachomatous Centers. Gaz. des Hôp., 1926, v. 99, p. 531.

The following measures are proposed:

(1) Creation of antitrachomatous centers at important points on Latin and Oriental borders.

(2) International concord and relation between these centers, whose number should be governed by our resources.

(3) Use of already existing aids given by the governments and the Red Cross.

(4) Help of the League of Nations to increase the resources and facilitate the adoption of rules concerning trachomatous travellers.

(5) Creation of a Mediterranean antitrachomatous entente and an international certificate for every trachomatous individual which could be demanded at every port and frontier with the passport. C. L.

Heal, G. Freeman. Excision of the Superior Tarsus and Conjunctiva in the Treatment of Trachoma. Brit. J. Ophth., 1926, Apr. v. 10, No. 4.

The author found this an effective method in the treatment of trachoma among the Arabs. It is particularly indicated in active trachoma with thickened deformed tarsus and trichiasis. It is contraindicated in cases in which there are no follicles, bluish conjunctiva, the tarsus not thickened. He leaves a narrow strip of the tarsus along the lid border. He has had no unpleasant results. Four illustrations accompany the contribution.

D. F. H.

Butler, T. Harrison. A Case of Retrobulbar Neuritis Following a Septic Wound. Brit. J. Ophth., 1926, Apr., v. 10, No. 4.

This is the case record of a man, aged 26 years, who, five years after an abscess of the arm, suffered deterioration of vision to 2/60. Fundus ex-

amination showed past optic neuritis. The peripheral fields were slightly contracted—the central portion revealed large scotomata. The case illustrates a systemic toxemia in contradistinction to the nasal local orbital suppuration. From a medicolegal point of view, there is a strong causal connection in that sight began to fail at the time of the arm suppuration. The author observed a similar case in a woman with an acute glaucoma who was operated on for a suppurating appendicitis.

D. F. H.

Thies, O. Bilateral Retrobulbar Neuritis After Burning of the Skin. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 384.

A man, aged 21, was scalded by hot salt water and showed burns of the 2nd and 3rd degree on the head, face, shoulders and limbs. Three weeks later he complained of visual disturbances and at the examination of the eyes after five more weeks, optic neuritis with circumpapillary edema and hemorrhages were noted.

The left eye recovered with slight pallor of the temporal half of the disc and V.=10/10, while the right disc showed indistinct margins and pallor of the temporal half and V.=1/10 with central scotoma.

A former case of the author and those of Lindenmeyer and Wagenmann had in common with the present one that the burns were of 2nd and 3rd degrees and the eye affection occurred in the third or fourth week. Apparently, the inflammation of the optic nerve was caused by toxins from the ulcers.

C. Z.

Brana, J. Marked Enophthalmus in Left Sided Facial Hemiatrophy. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 387, ill.

A man, aged 50, noticed for 15 years a gradual recession of his left eye. Skin, subcutaneous tissue and muscles of the left side of the face, left half of nose and of tongue were atrophic, and the enophthalmus was undoubtedly due to the atrophy of all soft parts of the left orbit.

C. Z.

Ball, James Moores. Skin Grafting in Acute Symblepharon. Weekly Bulletin of the St. Louis Medical Society, 1926, Apr. 22.

The author relates the case of a young man who, five days previously, had both eyes sprayed with lime, cement, and debris, from a hose into the end of which he had looked.

The right eye presented adhesions between the eyelids and the eyeball. The cornea was clear, and daily separation of the lids from the globe has left vision of 20/15 plus.

In the left eye were extensive adhesions, and a cornea that resembled porcelain. Under general anesthesia, adhesions were severed, dissection was carried to, and slightly beyond, the extent of the normal fornices, and reattachment was prevented by anchoring Thiersch grafts between the eyelids and the eyeball. A huge graft was sewed into the upper fornix.

For the lower fornix, a silver plate, of the approximate length and depth of the inner surface of the lower eyelid, was used. A large graft was placed over and sewed to the plate. The plate, thus covered, was then placed in proper position and anchored to the lid.

The separation of the eyelids from the eyeball was secured. The globe, however, became soft, distorted and was removed at the end of four weeks. The patient wears a too large eye at night, to prevent contraction of the tissues; and a smaller, cosmetic one, by day.

E. J.

Enroth, E., and Hisinger-Jägerskiöld, E. Capillaries of the Skin in Parenchymatous Keratitis. Klin. M. f. Augenh., 1925, Nov.-Dec., 75, p. 598, ill.

Twenty cases were examined according to the method of Müller-Weiss. The capillaries showed great tortuosity, considerable variations of the blood current thru the loops and lability of the walls in form of indentations, bulging, fluctuations of the lumen and occasional peristaltic contractions. These are common phenomena in several constitutional anomalies and dis-

eases, which have nothing to do with syphilis. If the capillaries of the limbus show the same morphologic and functional changes, which is probable, the nutrition of the cornea must be defective. This is perhaps the reason that the luetic virus may more easily invade the cornea of these constitutionally defective individuals and exert its deleterious effect.

C. Z.

Cardell, J. D. M. Krukenberg's Spindles. Brit. J. Ophth., 1926, April, No. 4, v. 10.

The contributor describes an example of this condition in a female aged 30 years. Her cornea presented vertical spindle shaped opacities occupying an area of about 1.5x3 mm. The eyes were myopic. Under the slit lamp, the pigment was almost on Descemet's membrane and composed of a multitude of closely set rings with clear centers. The author discusses the history of the condition, the characteristics of ten reported cases and etiology. D. F. H.

Axenfeld, T. Clinical Observations of Intrascleral Loops of Ciliary Nerves. Klin. M. f. Augenh., 1925, Nov.-Dec. 75, p. 602, ill.

A woman, aged 53, presented 3 mm. below the corneal limbus, a greyish white flat prominence 2 mm. in diameter. The temporal portion was firm on the sclera, the nasal portion could be moved and one could see under it a dark emissarium. The tumor was painful to the touch and on winking. It was extirpated with subsequent hyperesthesia of that area. It consisted of nerve tissue with varicose cylinder axes.

The affection was first described by Axenfeld in 1902, followed by observations by other authors, so that it is not very rare. So far it had not been decided whether it is a variation or malformation. C. Z.

Krey, O. Psicain an Anesthetic in Ophthalmology. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 399.

Psicain is one of the twelve possible isomers of the common leaf cocain. Two kinds are manufactured by Merck, the bitartaric and the sodium tartaric psicain, which gave Krey better results. It is an excellent surface anesthetic and acts faster than cocain, but causes now and then hyperemia. It does not burn like holocain and alypin, and is especially adapted for tonometry. It does not influence the width of the pupil and is harmless in glaucomatous eyes, but it injures the corneal epithelium like cocain.

C. Z.

Honti, G. Psicain, Tutocain and Diocain in Ophthalmology. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 404.

Honti made about the same observations as Krey, (preceding abstract), except that psicain does not affect the corneal epithelium. In the same quantity and concentration as cocain, it alone is insufficient for operations on the eyeball.

Psicain and tutocain are well adapted for short superficial anesthesia.

Diocain acts more powerfully than cocain in from 2 to 5% solutions, but it is more poisonous and is not adapted for injection. C. Z.

Wolff, E. The Treatment of Lime Burns of the Cornea by 10% Neutral Ammonium Tartrate. Brit. J. Ophth., 1926, April, v. 10, No. 4.

In this class of injury two factors produce the resultant corneal opacities. First, the caustic effect of lime destroys corneal tissue; second, the combining of the lime and corneal tissue forms particles of insoluble calcium carbonate. A 10% neutral ammonium tartrate solution instilled combines slowly to make a soluble calcium tartrate. The instillation should be preceded by a 4% solution of cocain. Two case reports are given. In one, observed four days after injury and treated for six weeks, vision increased from ability tc count fingers to 6/6. In the second, observed one month after the injury and treated for two months, vision rose from 6/60 to 6/12.

D. F. H.

Axenfeld, T. What Can Be Done to Avoid Late Wound Infections and Complications in Cataract Operations? Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 407, ill.

Axenfeld recommends in all cases the suture thru the tendon of the superior rectus, and after this, external canthotomy in some cases. He has done this more and more frequently lately. C. Z.

Elschnig, A. Suture in Operation of Senile Cataract. Klin. M. f. Augenh., 1926, Jan. 76, p. 30.

Elschnig recommends the preliminary insertion of the suture in all cases of extraction of the lens with the capsule, in dislocation of the lens and in patients in whom unruly behavior might be expected. C. Z.

Todd, K. Waller. A Case of Septic Focus in the Retina of an Apparently Healthy Boy Aged 15 Years. Brit. J. Ophth. 1926, April, No. 4, v. 10.

The author depicts the condition which in many aspects resembles thrombosis of the central vein. The youth of the patient and the absence of peripheral hemorrhages argue against this diagnosis. No septic focus was found. He gave a history of having had a head cold. Vision improved to 6/60. When last observed secondary optic atrophy was present.

D. F. H.

Elschnig, A. Detachment of the Zonula Lamella. Klin. M. f. Augenh., 1926, Jan., 76, p. 66.

Elschnig reports two further cases of detachment of the zonula lamella in glassblowers and one in a man, aged 27, who had diabetic iritis and glaucoma years ago, for which an iridectomy had been performed. He then had detachment of the retina which was cured by scleral puncture and cauterization in 1907. In 1923, he returned with cataract and a fine gray membrane in the pupillary area. After extraction within the capsule, a thin structureless plate overbridged the folds of the capsule, which Elschnig considered as zonular lamella.

The detachment of the lamella in glassblowers is produced by the radiation of heat in such a way that at first without any change of integrity of the lens, a change of elasticity, then rupture and finally detachment of the zonular lamella takes place. The opacity of the lens is entirely independent of it. C. Z.

Rotter, F. Detachment of the Zonula Lamella in Glassblowers with a New Slit Lamp Picture. Klin. M. f. Augenh., 1926, Jan., p. 71, ill.

Two cases are reported. One showed the typical picture described by Elschnig. In the second, on oblique illumination, the anterior border of a perfectly clear band projected from the pupil wavy and folded, on the lens, but its transition to the lens could not be made out by any mode of examination. C. Z.

Ballantyne, A. J. Spontaneous Absorption of Mature Senile Cataract. Brit. J. Ophth., 1926, April, v. 10, No. 4.

This is the case of a female aged 65 years, who had had cataract removed 13 years previously. At that time the fellow eye was affected. Sight became progressively dimmer up to four years ago at which time she was told the cataract was mature and ready for operation. Subsequently, her sight improved, vision with $+ 11. \supset 5.00$ cyl. ax. $180° = 5/12$. The slit lamp revealed the presence of the lens, its anterior surface being sprinkled with many white spots. The anterior surface was flat, the posterior retained its normal curve. The antero-posterior thickness was reduced one-third. The explanation offered was that the lens opacity was confined to the anterior cortex which was absorbed.

D. F. H.

Zborowsky, W. F. Nonulcerated Initial Sclerosis of the Ocular Conjunctiva. Klin. M. f. Augenh., 1925, Nov.-Dec., 75, p. 704.

A peasant, aged 32, presented an initial sclerosis in the shape of a smooth, transverse, oval, bluish-red, immovable tumor at the lower temporal portion of

the left eyeball. Seven weeks previously a piece of wood struck the eye and a woman attempted to remove it by licking. Wassermann was positive, and four days after his admission, a rash developed on the body. After six weeks with neosalvarsan and sublimate injections the condition improved, when the patient had to interrupt the cure. The preauricular and submaxillary glands were swollen, when first seen. C. Z.

Henssen, R. Etiology of Detachment of the Retina. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 344, ill.

The chief argument against the current views on the etiology of detachment of the retina is that they are mainly based on histologic findings in eyes in which the detachment had existed for a longer time, so that its orgin cannot be inferred from them. The more correct way is to examine myopic eyes before detachment occurs. Hanssen did this on 37 myopic eyes of patients who died from various diseases. He found partial degenerative destruction of the retina which was converted into a glious membrane, indentations, lacerations and holes in the inner strata and cystoid degeneration, especially in the anterior portion. With Vogt, he ascribes these changes to mechanical consequences of stretching of the sclera. They alone are not sufficient to cause detachment, but in connection with degeneration of the vitreous, as well known from liquefaction and opacities, and subsequent hypotension, help to explain the frequent beginning of detachment in the upper part. The changes indicate the possibility of a rupture, which Leber considers the precondition of detachment and which Henssen confirms.

The changes of the choroid in detachment of the retina in nephritis are much more frequent and intense than formerly supposed. Two such cases are clinically and histologically described in detail. They were caused by exudation from the choroid. C. Z.

Usher, C. H. Epithelial Cyst of the Sclera. Brit. J. Ophth., 1926, April, v. 10, No. 4.

This is the history of a healthy boy aged 4 years, who had had a small swelling on his left eye since birth but during the past two years the main increase was observed. There was a blue raised area 2.5x4.5 mm. at the nasal sclerocorneal margin. Two months later it measured 3.5x6 mm. Clear fluid escaped when punctured. Two months later the cyst reformed. Pressure on the cyst did not alter the depth of the anterior chamber. Examination of the excised cyst walls showed it to be lined by a stratified epithelium. There was no trace of foreign body, hair or glands. Two microphotographs accompany the contribution. D. F, H.

Zirm, E. Withdrawing of Vitreous for Opacities. Klin. M. f. Augenh., 1925, Nov.-Dec., 75, p. 730.

Four cases of practical blindness from opacities of the vitreous are reported. A puncture of the sclera was made after detaching the conjunctiva below the rectus externus and then 0.2 c.c. of vitreous aspirated with the syringe and the conjunctival wound sewed. The result was good only in one case, with improvement of vision from counting fingers to 5/10. Detachment of the retina seems to be a contraindication, C. Z.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. H. Alexander Brown, San Francisco; Dr. Wm. Thornwall Davis, Washington; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. George F. Keiper, LaFayette, Indiana; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. George H. Kress, Los Angeles; Dr. Edward D. LeCompte, Salt Lake City; Dr. W. H. Lowell, Boston; Dr. G. Oram Ring, Philadelphia; Dr. Charles P. Small, Chicago; Dr. G. McD. VanPoole, Honolulu.

SOCIETIES.

Dr. Arthur J. Bedell, Albany, has been elected president of the Alumni Association of Albany Medical College.

Dr. F. Park Lewis, Buffalo, has been elected first vice president of the National Committee for the Prevention of Blindness.

The Société francaise d'Ophtalmologie held its thirty-ninth meeting this year in Paris, May 10-13. The formal report presented by Prof. Gallemaerts of Brussels was upon Microscopic Examination of Affections of the Cornea with the Slitlamp.

PERSONALS.

Dr. Willis O. Nance has returned from a trip around the world.

Dr. A. Edward Davis has been made Consultant Ophthalmologist to the New York Post-Graduate Medical School and Hospital.

Dr. C. C. Clement, Chicago, has been spending the past two months visiting the hospitals and clinics in most of the larger European cities.

Dr. Frank Allport was married in San Francisco, on May 11th, to Mrs. Weed, formerly of Winnipeg. The couple is in Europe for an indefinite period.

Dr. William H. Wilmer, director of the Wilmer Institute for Diseases of the Eye, Johns Hopkins Hospital, received the honorary degree of Doctor of Science recently from Princeton University.

Dr. W. R. Buffington, of New Orleans, has been chosen to fill the place made vacant by the death of Dr. M. Feingold in the Undergraduate School of Medicine of Tulane University of Louisiana. Therefore Dr. Buffington has resigned his position as assistant surgeon in the Eye Department of the Eye, Ear, Nose and Throat Hospital of New Orleans and his professorship in ophthalmology in the Graduate Medical School of Tulane University, and is reorganizing his Eye Clinic in the Charity Hospital so as to be in readiness to begin teaching this winter. Dr. Buffington is at present associated with Dr. H. Dickson Bruns in private practice.

MISCELLANEOUS.

Plans have been made for the opening of a new Eye, Ear, Nose and Throat Hospital at Memphis, Tennessee, about July 31st.

The site of the Wills Eye Hospital at Logan Circle and Parkway, Philadelphia, has been offered for sale. It is estimated that it will bring $1,500,000. If it is sold, a new hospital will be erected on some other site.

The United States Public Health Service, in cooperation with the Kentucky State Board of Health and the State Medical Society, will erect on the estate of Mrs. Elizabeth Irvine at Richmond, a thirty-five bed trachoma hospital. It will be known as the Ephraim McDowell Memorial Hospital. Funds for its maintenance will be provided by the institutions which are founding it.

In the government campaign to eradicate trachoma from the American Indians a total of 136,551 Indians have been examined. Plans provide for the examination of all the 225,000 Indians under federal guardianship. Of the Indians already examined, 27,943 were found to be suffering from trachoma. Operations were performed on 8,457 and about 19,400 were given treatment, operation being deemed unnecessary.

Merger of two of the oldest special hospitals in New York City was completed last week when directors of the Manhattan Eye, Ear and Throat Hospital voted to unite with the Metropolitan Throat Hospital. The name of Manhattan Hospital will be retained and the work of the two institutions continued at its building Number 210 East Sixty-fourth street.

The plans for the new Westminster Ophthalmic Hospital to be built in Broad street, Bloomsbury, London, include provisions for 300 or 400 out-patients. Fourteen separate rooms for pay-patients and wards for 20 women and 10 children with 10 beds for cataract cases.

An advanced course in ophthalmology will be given at the University of Lyons, France, November 8 to 20, inclusive. The instruction will be given by Prof. Rollet and Clinical and Laboratory Chiefs Drs. Colrat, Bussy, Rosnoblet and Malot. About 3 or 4 hours of instruction will be given each day. Intending students should register with the Secretary of the Faculty of Medicine, Quai Claude Bernard, Lyons, France.

An ophthalmologic laboratory will be established at Harvard University by Dr. Lucien Howe of Buffalo as a memorial to his father, brother and father-in-law. Dr. Howe has given $250,000 and this will be supplemented by $175,000 from the General Education Board and $75,000 from Harvard University. For the present the laboratory will be located in the out-patient department of the Massachusetts Eye and Ear Infirmary. The work will include research and teaching. Dr. Howe will become director of the laboratory.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in *heavy-faced type*. The abbreviations means: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper.

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